UNITED STATES ARMY

NOVEMBER 1965

AVIATION DIGEST

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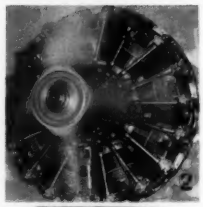

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NOVEMBER 1965
VOLUME 11
NUMBER 11

The mission of the U. S. ARMY AVIATION DIGEST is to provide information of an operational or functional nature concerning safety and aircraft accident prevention, training, maintenance, operations, research and development, aviation medicine, and other related data.

The DIGEST is an official Department of the Army periodical published monthly under the supervision of the Commandant, U. S. Army Aviation School. Views expressed herein are not necessarily those of Department of the Army or the U. S. Army Aviation School. Photos are U. S. Army unless otherwise specified. Material may be reprinted provided credit is given to the DIGEST and to the author, unless otherwise indicated.

Articles, photos, and items of interest on Army Aviation are invited. *Direct communication is authorized to: Editor-in-Chief, U.S. Army Aviation Digest, Fort Rucker, Alabama.*

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LETTERS

Sir:

During the past year I have never ceased to be amazed at the fantastic coverage and reporting of the many facets of Army Aviation's activities so adequately performed by your magazine. Being a professional commercial pilot and looking forward to a full and happy aeronautical career on the outside in the near future, I shall never forget the many articles I found in the past dealing with both rotary and fixed wing aircraft. My initiation into the STOL-VSTOL craft, I might add, not only began with other professional aeronautical magazines but also with your *Aviation Digest*. It is my intention to make your magazine a part of my professional reading material in the years to come.

Although I am a "Spec Four" I still wish to voice my appreciation to you and your staff for the wonderful performance in creating a truly thought provoking and imaginative magazine. I write these words not as a Spec Four but as a certified Commercial Airline Transport Pilot with the usual accompanying aeronautical ratings.

Interest in Army Aviation will most surely be captured by your *Army Aviation Digest*. I am sure that your magazine is most popular here at this end of the world.

It is indeed unfortunate that the US Army has bungled in not screening 201 files throughout the world for men like myself just waiting for the miraculous day when the Army decides to call all pilots serving in various positions not related to aviation for its flight program. How much easier would it be to integrate pilots such as myself into the program and not have to waste valuable time in training the cadet to use "stick and rudder." There are at least six pilots here who hold private and commercial licenses and are used in such positions as mine. Anyone can perform the tasks which my job requires, yet how many pilots does the Army have?

Something should be done about this waste of private and commercial pilots serving as enlisted men in non-aeronautical positions in the Army. Perhaps an article concerning this waste will appear in your DIGEST and enlighten someone at the top that good men are still waiting for the second call from the Army which saw fit to reject the pilot's initial application solely based upon his inability to pass the mechanical portion of the examination. Vietnam will be another Korea and the Army is going to need mature pilots as well as the youngsters now at Rucker's flight school. I'd gladly reenlist today for a direct Warrant Appointment but the Army just goes along on a one way track.

Cest La Vie!

You have a good magazine. I look forward to receiving it every month.

Sp/4 JAMES COCKRANE

Under current policy, anyone who seeks an aviator rating must attend a military training course even though he may have had previous civilian experience. The reason here is that the individual involved needs to learn the Army application of aviation. So, the saving in training which accrues from prior civilian experience is limited, even though there are provisions for accelerated graduation on a proficiency basis and attrition among this group is low.

Although we do not have a procedure established for screening records of all enlisted men for possible aviation qualification, we do have a program under which aviation experienced individuals, both in the Army and civilian life, are invited to apply for a direct appointment as warrant officers. This program is announced in DA Circular 601-6. By this means, we hope to get the individuals who are interested in an aviation career as warrant officers without having to screen the files of many who have no such qualifications or who may not be interested.

LT COL JACK T. DEMPSEY
Executive Officer, EAA, OPD

Sir:

It took courage for the DIGEST to publish "A New Kind of War" in the July issue. It took even greater courage to give it the Monthly Award when you stated, "The views and opinions expressed herein are the writer's and are not to be considered as an official expression of the Department of Defense."

Who is this author who dares to suggest that Army Aviators are capable of commanding tactical units that can close with the combat and enemy? How can he ever believe the vested interests of the Infantry, Armor or Artillery would allow a major combat development to take the form of a destroyer troop using helicopters organic to the small maneuver element?

Fantastic . . . yet, feasible.

Let us hear more from this thinking man's author.

CAPTAIN JOHN A. G. KLOSE
F Btry, 26th Arty
APO New York 09175

Sir:

I am leaving governmental service to go into business for myself as an Educational Consultant. I have been very much impressed with the caliber of your publication, since it does what I consider an excellent job of graphically dramatizing important teaching points.

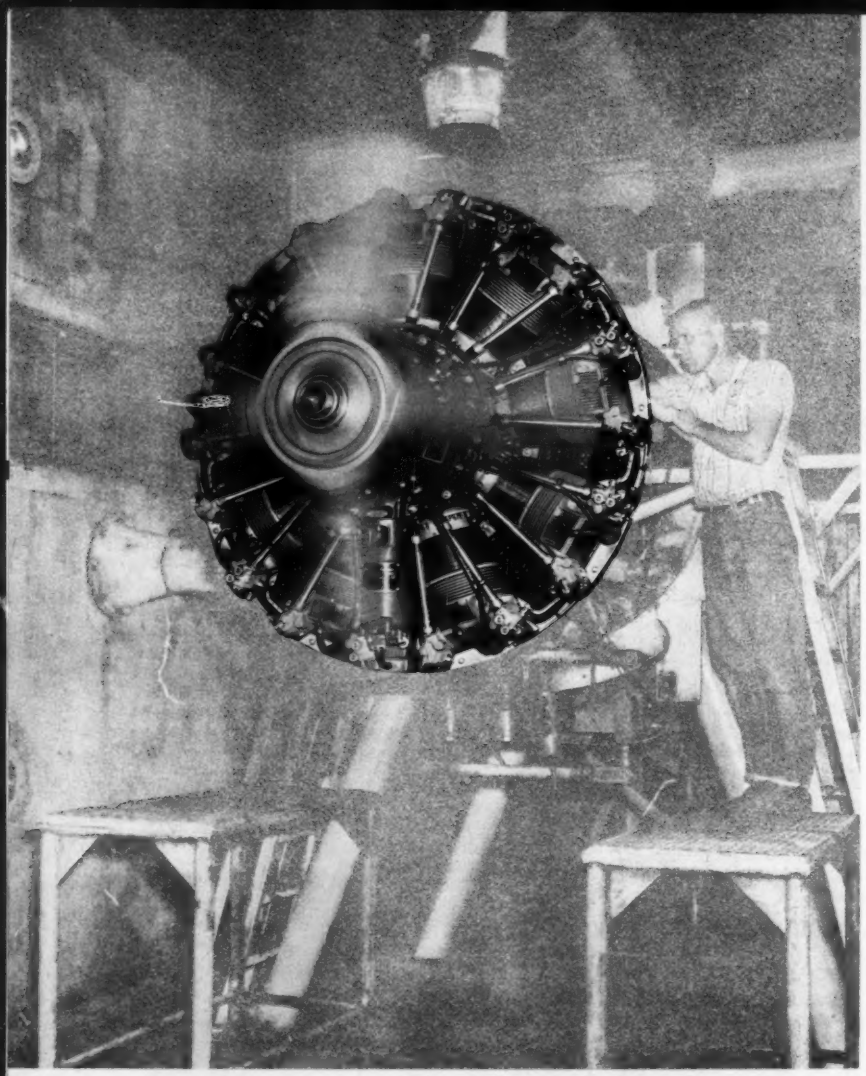
It is for this reason I'd appreciate being added to your normal distribution of this fine publication.

I very much appreciate your consideration of this request and will look forward to receiving regular copies of U. S. ARMY AVIATION DIGEST as they are printed.

ROBERT L. JONES JR.
5210 North Park Avenue
Indianapolis, Ind. 46220

Our office does not handle personal subscriptions to the U. S. ARMY AVIATION DIGEST. We are mailing you a subscription blank and an information sheet which explains how to obtain the DIGEST.

We hope that you will continue to enjoy the publication.



Test cell operator makes adjustments to timer during runup of an 1820-84 engine during an acceptance test before being stored. It will eventually be installed in a CH-34 helicopter.

Instant Engines

Brigadier General Durward E. Breakefield
Director of Maintenance, U. S. Army Supply and Maintenance Command

THE U. S. ARMY Aeronautical Depot Maintenance Center (USAADMAC) at Corpus Christi, Texas, is really "humming" these days. Workload has increased more than 25 percent over last year because of worldwide expansion of Army Aviation operations.

This is readily understandable since the depot is the Army's only "in-house" facility for complete maintenance overhaul and repair of rotary and fixed wing aircraft. The depot overhauls and repairs the full range of aeronautical items, including airframes, engines, components, and accessories of all types. In addition, AADMAC provides maintenance support in airframes, instruments, avionics and engines to the Navy and Air Force for various types and models of aircraft.

Virtually all types of Army aircraft have been overhauled and restored to top flying condition. Helicopters make up about 80 percent of the workload at the present time. The number one customer is the UH-1 Iroquois—the "workhorse" in Vietnam. Other helicopters contribute to the workload in roughly this order: the CH-34, UH-19, OH-23, OH-13, and CH-37. Facilities to work on the CH-47 will add considerably to the workload.

AADMAC's primary mission is to meet the maintenance requirements of aeronautical equipment

essential to the Army's overall mission, a rather big order. This includes overhaul, repair, modification, retrofit, modernization, and fabrication and maintenance in support of the National Inventory Control Point (NICP) and field elements of the Army.

Additional missions are to provide:

- Maintenance technical training base for on-the-job training of officers and enlisted men in aeronautical depot maintenance.
- A mobilization base for required maintenance services and support during the initial phases of a conflict.
- Avionics maintenance and calibration with receipt, test, maintenance, calibration and specific on-the-job training requirements.
- Processing of aircraft and components for overseas shipment. Herculite shipping covers, loose gear boxes, and landing gear cradles have been designed and fabricated within the shops.
- For the receipt, storage, and issue of certain NICP-owned inventory.
- Engineering services and analytical support such as teardown inspection, crash damage investigation, revising work specifications, updating materiel requirements lists, developing performance and quality standards, and oil analysis.

The support of Project FLAT-TOP is another AADMAC responsibility. [See DIGEST, April 65.] This floating aircraft maintenance facility (*USNS Corpus Christi Bay*) will be ready for worldwide operations by the end of this year. It will make possible the repair and maintenance of many aircraft engines and components on the scene so that they need not be returned to CONUS.

The biggest "shot in the arm" in AADMAC's 4-year history was initiation of the Zero Defects Program on July 19 this year. Technicians and craftsmen realize that it is up to them and have pledged 100 percent to do their job *right the first time*. Emphasis on defect-free workmanship will provide the very highest possible quality product for the defense of our nation.

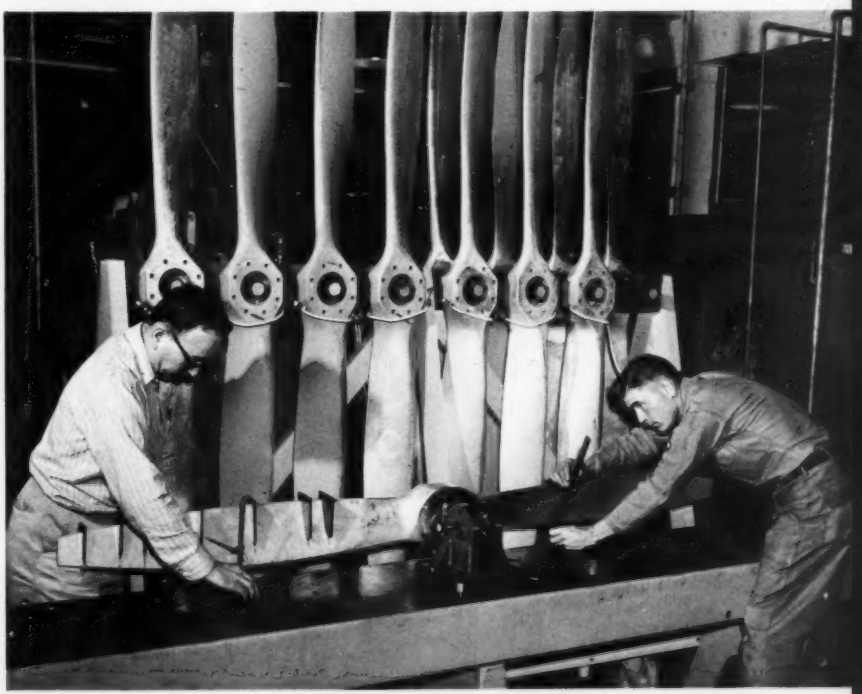
Aircraft arrive at AADMAC by land, sea, and air. Upon arrival they go to the receiving/inspection shop where the work "package" is examined and evaluated by experts. Each aircraft is then stripped of all paint, grease and corrosion, and components needing repair are removed and routed to specific overhaul shops. All structural repairs and applicable modifications are accomplished in coordination between the airframe and fabrication divisions.

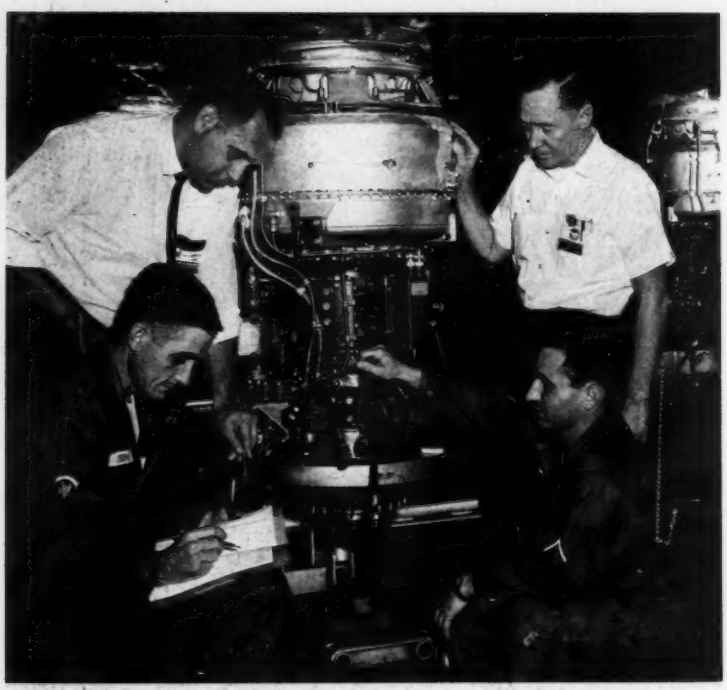
One hangar houses the final aircraft assembly activity. Repaired airframes have installed newly overhauled power train, avionics, instrument and hydraulic systems. Every part—zero timed—goes back in the aircraft where it belongs. After final inspection, the aircraft is painted, then turned over to the flight test pilots and mechanics for acceptance.

The workload has steadily increased, and shows every sign of continuing to do so. Maintenance and repair functions totaled slightly over $23 million in FY 1964. This past fiscal year the same functions have zoomed to over $28 million.

Colonel Floyd H. Buch, AADMAC's commanding officer, has given close supervision to the stepped-up maintenance and repair program. Paramount has been his personal attention to updating the facilities, adding maintenance and testing capabilities,

AADMAC personnel centerline propeller to get a quality product





Training soldiers is part of AADMAC's mission. Two mechanics make a final check of T-53 engine which they have assembled.

and establishing firm lines of communication with other interested agencies. To ensure continued progress he has instituted a 5-year military construction program, a 5-year capital equipment program, and a 5-year overhaul program.

The overhaul and repair facility was originally Navy-owned and included some production and capital equipment when transferred to Department of the Army in 1961. Replacement value of AADMAC occupied buildings and improvements is now over $26 million.

Good teamwork characterizes operations between the Army, Navy, and Air Force. Army interservice support agreements have escalated from several thousand dollars for FY 1962 to over $2 million for FY 1966. Army planes use the Navy's runways and numerous other facilities, like the all-weather flight trainer. The Naval Air Station also offers many other advantages, such as the use of its

Fitting an Iroquois with a reuseable Herculite shipping cover patterned and made at AADMAC. Cover will protect highly corrosive aluminum and magnesium parts from salt water when aircraft are transported topside.

ammunition storage facilities for small arms and explosives, aviation fuel storage and supply, and parachute cleaning and repacking facilities.

Another contribution to interservice cooperation is the agreement reached by AADMAC engineers and Navy representatives on the uniform overhaul specifications for three opposed aircraft engines. This permits either service to use uniformly overhauled engines in OH-13, OH-23, and O-1A aircraft. AADMAC will perform all overhaul work on these engines and will, by the centralization of all overhaul work and parts supply, save both services large amounts of money.

AADMAC is world-famous in ways that give pleasant surprises to its personnel. Recently an O-470 engine (used in the Bird Dog) was uncrated and an attached note read: ". . . In the future, please send us more engines and equipment – labeled AADMAC!"

The hermetically sealed steel containers used to "can" aircraft engines at the Army's maintenance center for shipment around the world have brought about a new phrase. We've had instant coffee, eggs, and everything else in the Army for years. Now we have *instant engines by AADMAC!*

Finding a "thank you" note. Employee examines note (reprinted, right) found in the O-470 engine uncrated at AADMAC, where it has been overhauled

NHA TRANG, VIETNAM

6A-103

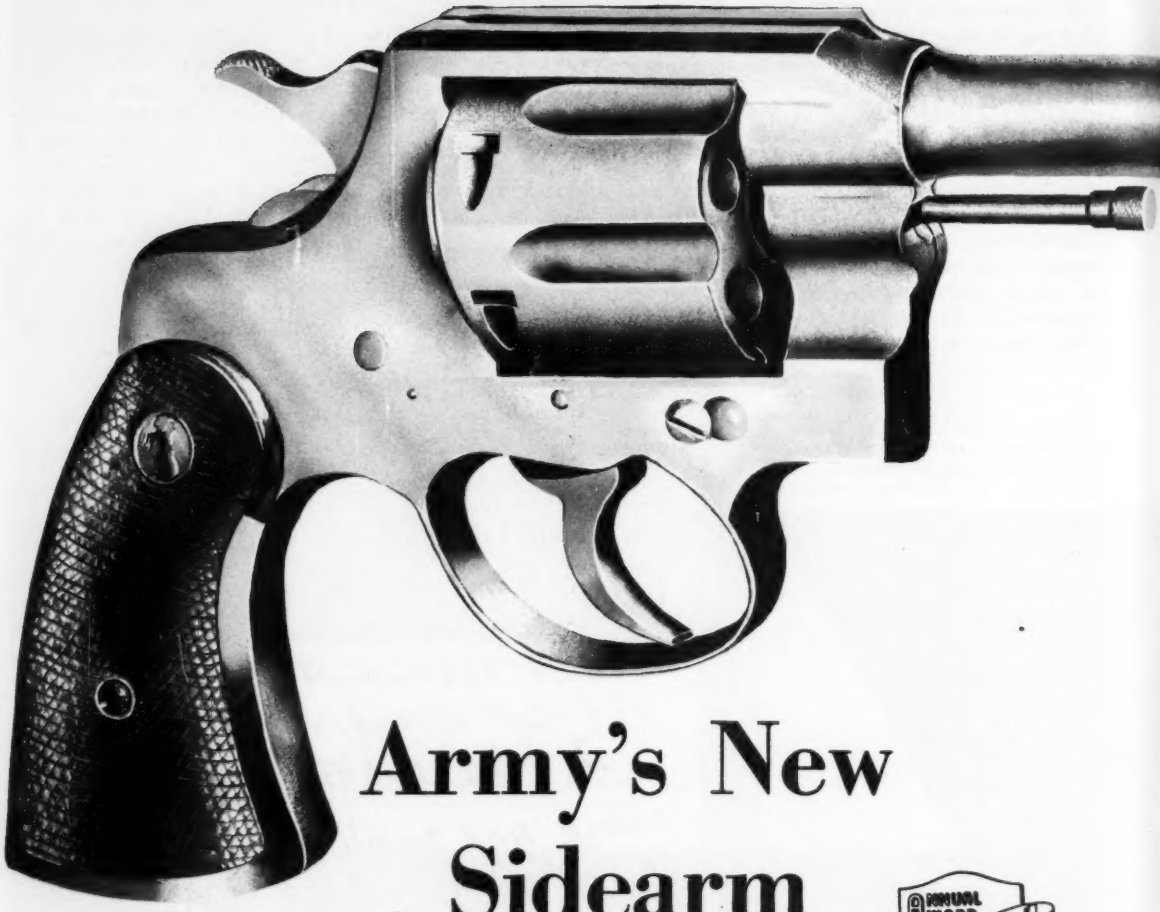
TO THE STATE SIDE GANG

THIS ENGINE HAS SERVED US, THE 73rd AVN Co. SOUTH VIET NAM, FAITHFULY THROUGH MANY COMBAT MISSIONS, AND SHOULD RECEIVE A MEDAL FOR ITS OUT STANDING DUTY.

IT HAS PURRED ON THROUGH LARGE AND SMALL ARMS FIRE, TO BRING THE PILOTS AND OBSERVERS BACK EVERY TIME. IT'S AIRPLANE WAS HIT MANY TIMES BUT THE ENGINE NEVER FAULTERED.

TAKE GOOD CARE OF THIS ENGINE, WE ALL LOVED HER.

THE MECHANICS + PILOTS OF THE 73RD



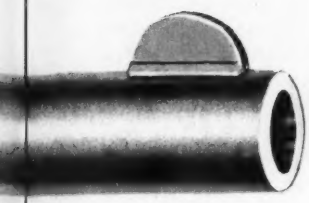
Army's New Sidearm

Captain Robert L. Webster, Jr.

LIEUTENANT Neverready crawled from his burning aircraft and stared numbly at the crushed, useless limb dangling from his left shoulder. The sudden crack of a rifle snapped Neverready back to reality. The enemy was closing in to finish him!

Overhead, air cover was keeping most of the enemy away from him, but one soldier undetected by the air cover was crawling toward him. Neverready jerked his .45 from his shoulder holster and frantically attempted to chamber a round by holding the pistol between his bloody knees and pulling on the slide with his good right hand. He was still pulling on his .45 when the grinning, black clad soldier slammed a bayonet into his throat.

Obviously Neverready should have had a round in the chamber at takeoff time this morning, .45 hammer on half cock, thumb safety on. Suppose he was so prepared. The enemy soldier charges in for the bayonet kill, Neverready flips the safety off, thumb cocks the .45 and fires hastily. Missed! and jammed! With one good arm, clearing the jam is out. Neverready vainly attempts to use his .45 like a club as the bayonet rips his guts open.



Army Aviation crewmembers are now authorized a revolver -- caliber .38, special, official police, 4-inch barrel. The new revolver replaces the .45 caliber pistol now issued. It will be available soon on an exchange basis as appropriate TOE and regulation changes are made.

Lieutenant LTBA (Lucky To Be Alive), III ate his last emergency ration yesterday. Three days ago he climbed out of the jungle trees that held his parachute (and him) for 2 hours. Most of his survival gear was lost in the bailout. He is hungry. Four meters away sits a grouse-like bird pecking at grub worms in a rotten log. Drooling, LTBA draws his .45 and takes careful aim. If only he could hold this .45 a little steadier! Wham! The grouse launches and LTBA curses. Twenty days later LTBA is picked up, mumbling to himself and picking grub worms from a rotten log.

Exaggerated tales? Of course. But these little episodes illustrate the need for a more versatile and dependable side arm for aviators. The side arm is primarily for self-defense, but at the same time the weapon should be equally adaptable for use as a survival gun. The .45 is a very poor weapon for survival hunting. Granted, the aviator's side arm is primarily for man killing, but we are looking for a weapon that can double as a survival gun without sacrificing any qualities necessary for its use as a self-defense weapon.

The revolver, double action, has many good points to consider in selecting a good, dependable side arm for aviators. Generally speaking, revolvers can be obtained in a lighter weight and smaller size than the standard .45 pistol. A missfire in a revolver is cleared by merely pulling the trigger again, and the cylinder revolves to the next cartridge and fires. It is not necessary to take a revolver apart for cleaning, and a jammed revolver is so rare that it is not a realistic consideration.

For its aviation crewmembers, the Army is adopting the .38 special which is used by the USAF, USN, and USMC pilots. Ball, tracer and birdshot rounds are available for the .38 special. (The Special Air Warfare Center, Eglin AFB, Fla., has tested .38 flare ammo, .45 flare ammo, and "pen-gun" type flares and found .38 flare ammo to be the most satisfactory.) The ball round has ample power to kill a man and the tracer round can be used in lieu of a signal flare at night. The .38 special birdshot round is excellent for shooting small game at close range, and this capability would tremendously increase the weapon's use in a survival situation.

Those who might prefer a weapon of their own other than the .45 or .38 special, might consider the .357 magnum revolver which is available for private purchase. It fires any .38 special round of ammunition without modification or damage to the pistol. Like the .38 special, it has the power to kill a man and is excellent as a survival weapon. Using the .357 magnum round ball, the magnum revolver easily kills deer, wild pigs, and similar sized animals. I personally prefer this weapon over the .45 or .38 special and will be carrying it when I fly over remote or hostile areas.

Lieutenant Neverready pulls his revolver from his holster, fires, misses and pulls the trigger again. Missfire! He confidently pulls the trigger again and the cylinder revolves a third shot that fires, dropping the black clad soldier in his tracks.

Lieutenant LTBA places a .38 special birdshot round in his revolver, takes unsteady aim at a grouse 4 meters away and squeezes the trigger. Wham! The grouse topples over as the wide birdshot pattern covers up for LTBA's lousy aim. Twenty days later LTBA is picked up, mumbling to himself and eating roasted grouse.

Capt Webster is with the Rotary Wing Suppressive Fire Branch, Dept of Tactics, USAAVNS, Ft Rucker, Ala.

Here's a reminder for those "desk" types whose tour is almost up:
Before you go making like the ace of the base recall

A Thing or Two from B Phase

Captain Albert Hervey

"I'M TOO SMART for this to happen to me." That's what one aviator said he kept thinking over and over again as he crashed a Beaver while on approach to a strip under near ideal conditions.

The funny part of this sad tale is that he was right. He was too smart to pull the stunt that got him in trouble. Back at Fort Rucker he was one of the top students in his class. His instructor described him as a natural born flier.

Furthermore, he had many other abilities that made him a good officer. Enlisted men seemed to trust him implicitly, indicating he was a good leader. And his natural administrative ability made him much in demand for desk type jobs.

The result was that after graduation he was kept very busy doing everything but flying. In three years he logged less than 300 hours of flight time, mostly in carrying his superiors from one big field to another. The "tightest" strip he made an approach to was something on the order of Dulles International or Greenum Common.

Then came the day when our aviator friend had to make a landing on a little dirt strip way back in the boondocks.

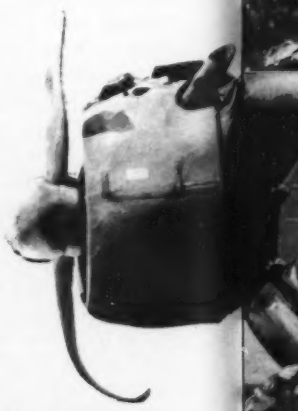
In school he had gone in on much smaller ones in much worse condition, and he didn't worry much about it. But his grades in flight school and his successful military career up to this time now played him foul. He became overconfident. He had forgotten many of the little things the instructor had told him. The sharp edge of his training had been dulled by lack of use. This otherwise perfect soldier crammed himself doing something that should be natural to all Army Aviators.

"But," you say, "our friend got 100 hours of flying a year, which is far more than is considered necessary to remain proficient." And it is. But the trouble is he, like most of us, didn't use his flying time to its best advantage. When we take an aircraft up on a routine training flight we should consider ourselves students again and practice, practice, practice.

An old adage written many years ago should be every desk type flier's motto: *It's not the hours you put in that count but what you put in the hours that counts.*

Of course every aviator who takes up an aircraft practices the things he learned in A phase. If he didn't he wouldn't get the airplane off the ground. But most neglected are the bread and butter techniques of Army Aviation found in B phase, especially operations in and out of short, unimproved fields and strips. As desk jockeys, this is the thing we must practice over and over again if we are to remain proficient Army Aviators.

Let's then review the techniques involved in this maneuver. Let's use an imaginary character—a Captain Gobel. He is much like our first friend in that he finds himself mostly behind a desk. He has little time to fly but manages to get off every two or three weeks to keep his flight pay coming.



Captain Gobel is smart enough, though, to realize that he is not as good an aviator as he would like to be. Because he flies so little he may not even be as good as when he first got out of flight school.

He guards against overconfidence by going to a safe altitude and practicing some slow flight or even a few turns, varying the bank and number of degrees turned. He gets an idea of his own limitations again and also gets the feel of the aircraft.

Now he's ready to practice landing at a strip. To begin with, he picks one that appears to have little challenge. Here he can afford to overshoot his

---

Capt Hervey is a flight instructor with the Advanced Contact Flight Div, Dept of F/W Tng, USAAVNS, Ft Rucker, Ala.

touchdown point a little while he gets back in the swing of the power approach. Later he'll try some strips with a little more challenge built in.

As Captain Gobel comes in for his first landing he remembers his flight school days. Back then he had an instructor to guide him in. Now he has none but he can still hear his instructor saying, "There are really no rules except to do it the easiest way possible."

After making two or three practice landings our hero goes out to look for something a little harder. While he's flying around, the wind changes to light and variable. The new strip he selects has an upslope to the north, high barriers on the south end, and what looks like a ditch or two on the sides of the strip. There is even a hole in the center.

The easy way to land on this one is hard to find. He must do everything possible to reduce his groundspeed. What wind he has is still out of the north. He will land against this but not depend on it to slow him down. He also takes into consideration the fact that he will need an unobstructed entrance.

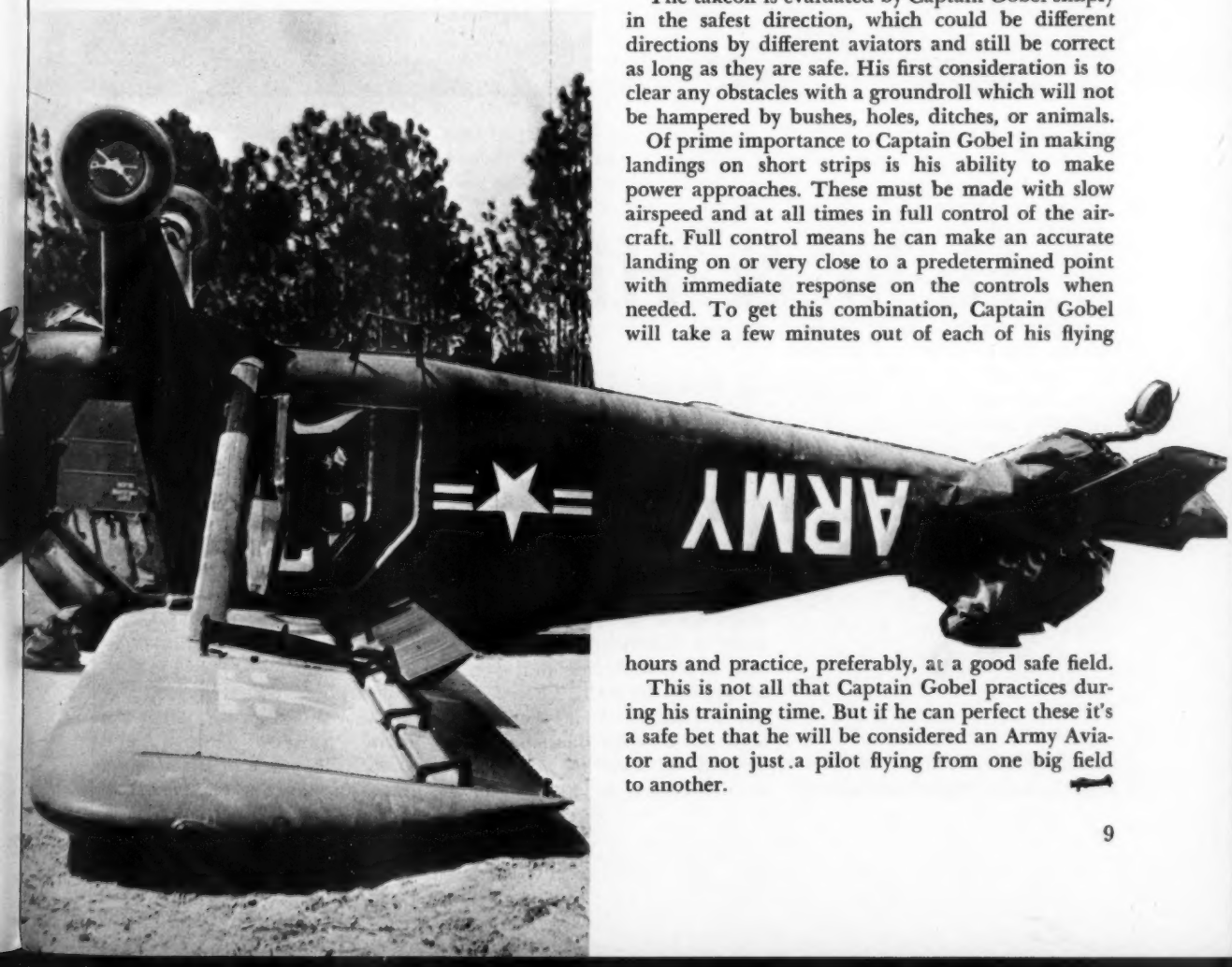
Along with these problems he must also give consideration to a preplanned method of getaway in case something goes wrong. It must allow him to get out or land with room to roll out.

No, Captain Gobel doesn't take bets with himself that he can land the first time. Nor does he become determined that if the first approach doesn't work, he'll get in on the second, regardless. He well knows that such foolishness can end with the wing wrapped around a tree. He knows that with conditions as they are, he may not be able to land at all. The barriers may be higher than he thought or the wind may shift or change.

Captain Gobel has long since found that the difference between a 2 knot headwind and a 2 knot tailwind can be more than 4. It can be the difference between a successful approach and "buying the farm."

The takeoff is evaluated by Captain Gobel simply in the safest direction, which could be different directions by different aviators and still be correct as long as they are safe. His first consideration is to clear any obstacles with a groundroll which will not be hampered by bushes, holes, ditches, or animals.

Of prime importance to Captain Gobel in making landings on short strips is his ability to make power approaches. These must be made with slow airspeed and at all times in full control of the aircraft. Full control means he can make an accurate landing on or very close to a predetermined point with immediate response on the controls when needed. To get this combination, Captain Gobel will take a few minutes out of each of his flying hours and practice, preferably, at a good safe field.



This is not all that Captain Gobel practices during his training time. But if he can perfect these it's a safe bet that he will be considered an Army Aviator and not just a pilot flying from one big field to another.

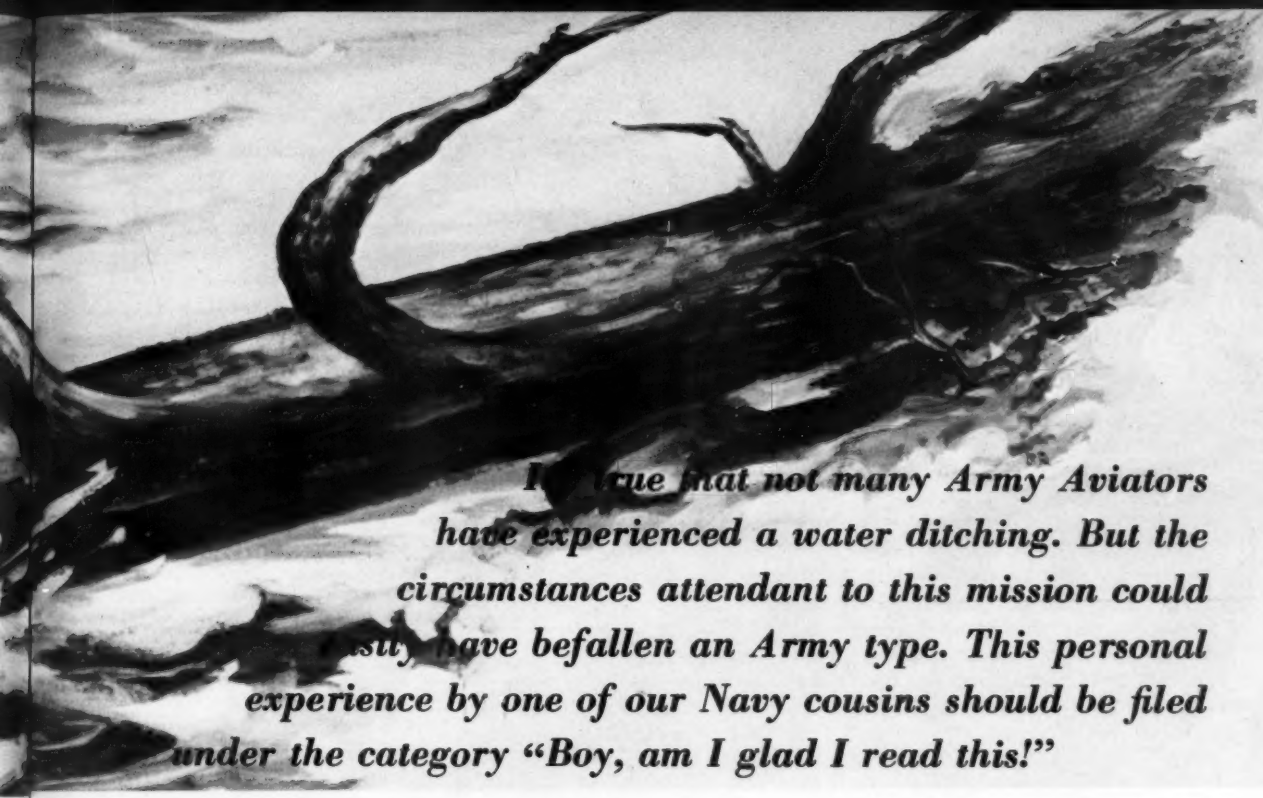
Helo & High Water

Reprinted from APPROACH magazine, September 1965

THIS IS THE survival story of a helicopter pilot whose CH-34 went down in a flood swollen river while on a photo-reconnaissance mission. The aircraft struck an uncharted telephone wire strung across a river between two tall trees. Only the pilot survived.

It was the morning after Christmas. Copilot, crewchief and pilot briefed and preflighted, departing the carrier for an airport in the flood area in support of Civil Defense for flood disaster relief. At the field, the crew was given a general briefing and told to await assignment. At 1115 they were given a priority photo mission with a photographer and spotter assigned to the flight. The mission was briefed with no particular flight route assigned other than to proceed to areas of devastation and to return to base no later than 1400. For a quarter of an hour they flew around the local bay area and took photographs of the flood damage. The spotter then told the pilot the worst damage was along the river. They flew up the river, taking photographs as they went.

The pilot spotted a group of people with a highway patrolman waving at the helicopter, and landed. He was told that several persons needed to be evacuated.



It is true that not many Army Aviators have experienced a water ditching. But the circumstances attendant to this mission could easily have befallen an Army type. This personal experience by one of our Navy cousins should be filed under the category "Boy, am I glad I read this!"

He informed the highway patrolman that he was on a specific mission, but that he would stop on his way back to evacuate these people in about 20 to 30 minutes.

Continuing on up the river, the crew spotted a man with a distress signal laid out—an "H" in cloth on the ground. He was picked up and transported to a farmhouse a half-mile up the river. The helo was unable to land near his house but arrangements were made to evacuate him along with his family from an open field a half-mile from his home. The pilot recorded his position and told him another helo would be out. The three elderly people at the farmhouse where the helo had landed said they wanted to stay but they needed food. The pilot left them a case of C rations.

At this time the weather was beginning to deteriorate, with rain, 300- to 500-foot ceilings, and visibility ½ mile.

The helo took off and proceeded back by the same way it had come. About a mile along, two children were waving in front of a house on the side of a hill above the river. A man and woman appeared at a window, waved and gave a thumbs up to the hovering helo. Assuming the family was all right, the pilot moved off down the river.

"We were approximately 50 feet and 75 knots when I asked the copilot to take control of the aircraft so I could mark the locations of the three previously mentioned houses," the pilot states. "I had put an 'X' for the first place when I heard three or four loud bangs from the main rotor."

The pilot immediately took the controls and tried to add power.

"The aircraft felt as if it was losing lift and about to fall out of the air," he recalls.

Corrective measures failed. The helo flared slightly and hit the water.

"Before leaving the cockpit," the pilot states, "I put my hand out towards the copilot's side but felt nothing. I remember that prior to the crash my side window was opened fully and the copilot's was approximately three-quarters closed. On liftoff the crewchief was in his seat, the photographer was two or three seats back on the left side, and the observer was alongside the photographer.

"I experienced little difficulty in my egress from the cockpit except for my radio cords. I removed my ND-10 helmet and inflated my life vest. I estimate I was 20 to 25 feet underwater.

"When I came to the surface, I saw a part of the aircraft bob to the surface and then almost immediately it sank again. I saw no other survivors. Debris was in the water all about me—a clamshell door, two hardhats, one of which was mine, the horse collar, a large waterproof bag containing my sleeping bag and air mattress,

and a cardboard box of blankets. As the waterproof bag floated by, I grabbed it. It seemed to be buoyant so I put it between my legs.

"As I floated away with the river current, I continued to look at the scene of the accident but I saw no signs of survivors. The inner current was so swift that I was unable to get out of the middle.

"I had been in the water for about 35 minutes when I finally spotted a man on the left bank. I yelled at him but was swept on. Shortly thereafter a helicopter flew over but the pilot did not see me. I took off my gloves and tried to ignite a day distress signal but my hands were so cold that I couldn't manipulate the D-ring readily. In my haste I pulled it off and dropped the signal. Before I could attempt to light my second one, the helo was gone. I attempted to retrieve my gloves, which I had put in one of the lower pockets on the flight suit, only to find them missing along with a pencil flare gun which I kept in the same pocket. I also lost my survival knife and switchblade knife from an open pocket.

"A few minutes later I spotted several people on the far south side where the north and south forks of the river meet. They saw me and said they would try to get help. About five minutes later a light civilian plane circled me and I managed to ignite the night end of my distress signal but he did not see me.

"About a mile further on there was a large tree trunk sticking out into the river. Since the force of the current was somewhat decreased in this section, I managed to grab the tree and pull myself up onto the bank of the river. At this time the cold temperature of the air and water became extremely penetrating and I began to shiver uncontrollably.

"Ten minutes later, this same chopper—an Army helicopter—returned downstream, spotted me and landed on the upper bank. I used a white-backed map to attract their attention. Two pilots came down the bank and carried me up to a place where the chopper could land. I was taken from there to the hospital . . ."

The survivor had a cut forehead, a broken foot, a sprained ankle and knee, and severe bruises of two ribs.

Despite the fact that the survivor was immersed in extremely cold water, 42-44° F., with an air temperature of 55° F., he was able to function adequately for better than an hour before he began to experience the effects of exposure in the form of uncontrollable shivering, the investigating flight surgeon reports. "There is no doubt that this is directly attributable to the use of the winter flying suit—the two-piece liner for the Mk-4 antiexposure suit. The pilot also wore two pairs of sweat socks and a high-top ski sweat shirt. His antiexposure suit liner contributed to his buoyancy.

"It would appear," the flight surgeon continues, "that the difficulty encountered by the survivor in igniting his distress signals was related somewhat to a lack of complete understanding as to the proper method to be used . . . However, the environment and circumstances could hardly be considered ideal and the combination of numbing cold, turbulent waters and duration of exposure could account for . . . apparent discrepancies. The loss of the pencil flare gun from a pocket of the flight suit was indeed unfortunate, since conceivably with it the pilot could have attracted help from the air earlier and, thus, could have been rescued sooner. Perhaps a more stable lodging place, such as a pocket on the Mae West, would have prevented the loss of this valuable survival item."

The flight surgeon had some comments on the survival equipment and training aspects of this accident:

• Efficacy of flight clothing: This pilot's experience utilizing only the liner of a Mk-4 antiexposure suit (despite his loss of gloves and hardhat) suggests the need for some re-evaluation of recommended flight clothing, especially as it applies to helicopter pilots in flights over water in cold weather. The lack of the antiexposure suit itself does not appear to have been a deciding factor in this particular pilot's survival while the liner by itself appears to have contributed some additional buoyancy.

• Indoctrination in ditching procedures: The plight of the occupants who did not escape from the aircraft serves as a reminder that ditching procedures, particularly for those riding in the belly, need to be a part of every preflight briefing (as it was in this particular flight).

• Proper use of survival equipment: It is not enough simply to be aware of the physical presence or to have received indoctrination in the use of survival equipment. The establishment of an active program of practical testing of survival techniques (is required) including such items as the proper use of distress signals manipulations wearing wet gloves, maneuvering in the water in a life vest, and determining where items such as a pencil flare gun can most efficiently be secured (for retention by) helicopter pilots.

Operation Knockout

William H. Smith

Here's a good account of the help aircraft can give troops in blocking avenues of escape.

"Eagle 1 was airlifted into LZ 1 at 1415 . . ."

OPERATION Knockout" was a real lulu. It contained all elements of a sophisticated battle and many of the other little tricks possible in a guerrilla affair.

On Thursday morning we learned that a Viet Cong battalion was located in a small village nearby. The VC had come up the river at night, bypassed an outpost, captured the villagers and moved into their homes. The villagers had been taken to some other spot, probably a wooded area about a mile away.

Naturally the local ARVN (Army Republic of Vietnam) division commander was boiling about this latest outrage. He said he was going to do everything possible to see that the communists responsible were punished. He wanted to take immediate action against the Viet Cong.

We got together with the ARVN and came up with a plan that we felt had a good chance of succeeding. We would use our airmobile forces to block all avenues of escape from the village and then proceed to work over the reds. The problem was to get the blocking forces into position without the VC knowing it. If they learned of our little plan too soon they would escape, and the old story would be repeated: all we'd find would be empty houses and deserted mangrove swamps.

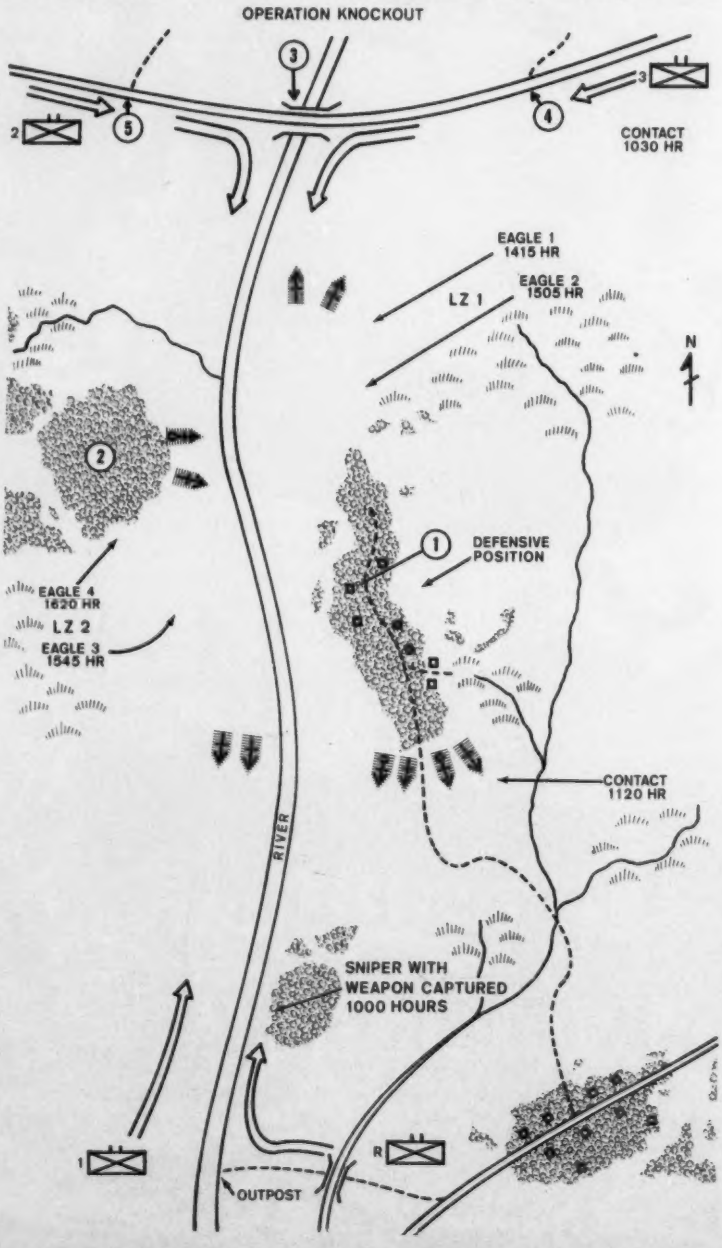
To surprise the Viet Cong we devised a deception. On two occasions in the past 45 days a battalion of ARVN troops had gone to resupply the outpost the reds had bypassed south of the present VC concentration. After resupplying the outpost the battalion moved south by boat to reach another outpost and resupply it.

In the deception a battalion of infantry would be sent to the outpost, presumably as a resupply agent. Arrangements would be made in a nearby town for boats. The ARVN G-2 felt that someone in the town furnished information to the communists.

On the morning the operation was to start, the battalion would move as if to go down river but actually land on the west side of the river and go north. While they were doing this the Ranger Battalion would arrive at the outpost and start north on the east side of the river.

Meanwhile, two other infantry battalions assigned to the division would seal off the escape routes in the north. The 2d Battalion would seize objective 5 (see map), continue down the road to link up with the 3d Battalion at objective 3. From there it would go down the river on the west bank and with the 1st Battalion seize objective 2.

As reserves, four Eagle Forces



would be made up of picked men from other units of the division and the assigned reconnaissance company. These special infantry units would be airlifted into areas where needed.

The operation went off pretty much as planned. The 1st Battalion arrived at the outpost early Friday morning. They went about their resupply business and hired local boats for the trip downriver.

Before daybreak the next morning the boats arrived and the troops loaded up. By 0800 hours they were on their way downriver. At the same time the Ranger Battalion appeared in the nearby town. Until the rangers showed up none of the local people knew this to be anything but a normal resupply.

The 1st Battalion sailed downriver until it reached a good spot to disembark. The boats were beached and the troops unloaded their equipment. They then moved on foot back up the west side of the river towards objective 2.

The Ranger Battalion moved through the town and onto the outpost. From there it moved up the river on the east bank towards objective 1. The 2d and 3d battalions moved on toward the 4th and 5th objectives as planned.

As the Ranger Battalion moved across a cleared area an ARVN soldier in the point was shot by a sniper hiding in a nearby woods. A platoon was immediately ordered to surround the wooded area and capture the sniper. Exact locations and fortifications of the Viet Cong were needed at this time.

The sniper gave up quickly when he saw he was surrounded. He was immediately taken to the battalion intelligence officer but refused to talk.

As the S-2 of the airmobile battalion I worked closely with my ARVN counterparts. The S-2 of the ARVN Ranger Battalion had become a particularly good friend. As soon as he had the sniper he called me and asked if I wouldn't pick up him and the prisoner and take them back to the division CP.

"If you do this favor," he chided me, "I'll let you help interrogate him."

The prisoner was sullen and silent. But as soon as we lifted off, his attitude began to change. He had never flown before and he became more interested in this strange bird and less concerned about his own trouble. I offered him a cigarette and he smoked it as best he could with his hands tied. After we landed we put him in a room and had the ropes removed from his hands and feet. We offered him a glass of warm tea which he drank eagerly.

Then we started the interrogation. For a while he wouldn't answer, but gradually the impression on his face changed. He considered each question a little before shaking his head.

As we handed him another cigarette I asked him again where the main body of troops was located. I kept my voice low and tried to make the question sound casual.

After taking a few puffs on the

Battalion moves on foot back up the west side of the river

Viet Cong sniper surrenders quickly

Operation Knockout

cigarette he suddenly started talking. He said he was glad to be talking to us. We weren't as bad as he was told. The helicopter rode nice, the cigarette was good, and he was happy to stop fighting.

To my question about the Viet Cong, he said that most of them were in the village. The rest had found things too crowded and had moved across the river to a small wooded area (objective 2).

According to him there was a whole battalion of them, but when I asked about numbers his answers indicated there were fewer men than what we would call a battalion.

I asked him about the defenses and he quickly pointed to several fortified areas on a map and even told me what type weapons were in each.

Then came a flood of words that I could only interpret to be a denial that he personally had done anything wrong to the inhabitants of the village. And like most captives, he never had been a communist, just one of those forced to fight for them.

While we were engaged with the prisoner, two OV-1 Mohawks made a reconnaissance of the area. Photographs made by them showed two good landing zones (LZ) for the Eagle Forces. One was to the northeast of objective 1 and the other southwest of objective 2.

The photographs also confirmed the fortifications. To seize objective 1, the rangers would have to assault these dug-in-positions. It was decided to use air strikes to soften them up before the rangers got there. Three A-1E Skyraiders of the VNAF (Air Force Republic of Vietnam) were selected to do the job.

While all this was going on in the south, the two infantry battalions in the north were proceeding with their part of the operation. The 2d Battalion didn't meet with much resistance in the initial part of their advance. Occasionally a sniper would fire and disappear into the woods. The battalion took objective 5 with no trouble and proceeded down the road.

The 3rd Battalion met some determined resistance in the vicinity of objective 4. After a 15-minute firefight the VC withdrew and the battalion was able to take objective 4 and move to objective 3.

About noon the Ranger Battalion reached the enemy fortified area. Several assaults were made. However, the Viet Cong were well dug in and repelled the attacks.

Continuing their reconnaissance, the Mohawks discovered some communists were slipping out through LZ 1 to the northeast. Fearing that some of the higher ranking reds might escape, the division commander decided to use his Eagle Forces to plug up this hole. This maneuver would have the added advantage of relieving the rangers in the south.

Eagle 1 was airlifted into LZ 1 at 1415 with the mission to attack west to the river, then south on the east side of the river and link up with the Ranger Battalion.

"Viper" armed platoon was assigned the mission of providing suppressive fire support to the Eagle Forces. I went along to help provide suppressive fire while the troop-carrying helicopters were on the ground. As soon as the troop carriers had landed their men they headed back for more.

Two helicopters from the third armed platoon had a strange mission, or at least it was strange for our gun ships. They were to keep the Eagle Forces supplied with ammunition. As soon as the troops landed, the two armed ships would come in, dump boxes of ammunition and other supplies and take off for more.

This proved to be a highly successful maneuver. In some of our other operations the Eagle Forces had complained that they were always afraid they would run out of ammunition, and as a result they curtailed their firing, sometimes unnecessarily.

The two armed helicopters kept up such a steady supply of ammunition that at one time the Eagle Forces asked them to lay off for a while as there was more ammunition on hand than could be carried.

While helping Eagle 1 the gun ships had to pass over the village. They received heavy fire from the houses which were in a long thin line of trees and scrub vegetation. Four Hueys took turns running down the long axis of the village. Both .50 caliber machineguns and 2.75 inch rockets were used. After the expenditure of 43 rockets and innumerable .50 caliber, the reds stopped firing and the strike was called off.

Eagle 2 arrived at 1505 hours and landed. Once linked up, Eagle 1 and 2 attacked the VC to their front and reached the river. They began receiving flanking automatic weapons and mortar fire from the west side of the river which kept them from advancing further.

The 2d and 3d Infantry Battalions had by this time reached objective 3. Brushing aside the minor resistance found there, the two battalions turned south toward objectives 1 and 2.

Eagle 3 was airlanded in LZ 2 at 1545 on the west side of the river with the mission of flanking the reds fighting the 1st Battalion. As soon as they had neutralized these they were to turn north and with the 1st Battalion attack the south side of the red concentration in objective 2.

Once Eagle 3 began its attack the reds broke and ran. Some went back to objective 2 and others took off across the cleared areas between LZ 2 and objective 2.

Eagle 4 was airlanded in LZ 2. The mission was to move directly toward objective 2, cutting off the retreating reds. Even though the armed helicopters kept a steady fire, the reds in objective 2 managed to hit one of the troop-carrying helicopters during the landing. The hit was not a serious one, however, and the helicopter continued to fly.

With the landing of Eagle 4, the Viet Cong in objective 2 found themselves being attacked from three sides. The river was, of course, on the fourth. Their position was hopeless and some tried to escape. The .50 caliber fire team made several firing runs on them as they ran across the field and rice paddies.

With objective 2 taken, Eagle Forces 1 and 2 were no longer subject to fire from across the river and were able to continue their advance on objective 1.

As soon as objective 2 was taken, the 1st and 2d Battalions turned their attention to objective 1.

The gunships received heavy fire from the houses which were in a long thin line of trees and scrub vegetation. Three Hueys stopped the fire with 2.75" rockets and .50 calibre machineguns.

Operation Knockout

From my vantage point I could see them lobbing one mortar shell after another over the river into the VC fortified area and the now almost destroyed village.

All this fire reduced the number of defenders of objective 1 to a mere handful. As soon as it got dark these fled across the rice fields and vanished in the swamplands to the east. By 2100 hours the fighting was over.

All aircraft were released at 1930 hours. The next morning the troop-carrying helicopters returned to the area to pick up the Eagle Forces. Their most important mission was to transport the Eagle Forces and to furnish cover and suppressive fire.

One armed platoon was kept flying over the operational area all the time, giving the reds no rest from this quarter. At 1730 hours when Eagle 4 was being airlanded two armed platoons were in the air.

Two .50 caliber armed helicopters were flying over the area all the time and were available to the ground forces whenever needed. These helicopters proved to be exceptionally useful when the reds attempted to flee.

During the operation an O-1F Bird Dog flew high overhead to furnish the much needed radio relay. It also carried an observer who furnished visual reconnaissance.

And, of course, there were the two Mohawks that picked out the LZs and furnished other information.

Because of intensive fire from ground weapons in the operational area, the helicopters received many hits but none were put out of action. All were repaired and ready to fly again in a few days.

One armed platoon had 17 hits in five of its aircraft. In this same platoon one gunner sustained a fragment wound and one aviator was cut from flying plexiglass when his aircraft was hit. Another platoon received 19 hits in five of its aircraft and three pilots sustained cuts from shattered plexiglass. The third armed platoon saw much less action than the other two and received only one hit and one gunner was wounded in the toe.

At the critique we learned that 27 ARVN soldiers had been killed. Most of these died assaulting the fortifications. The number would have been much higher if the ranger platoon had run into the fortifications blind.

Sixty-two friendly troops were wounded. Nine of these were considered serious and were evacuated to hospitals by the ambulance helicopters. Six American advisors were wounded in action, none seriously.

In searching the area 115 dead Viet Cong were found. At the time of our critique we had not received information as to the number of wounded. Only three of the enemy were captured, one of them being my sniper.

All kinds of weapons and equipment was found. Among these were three 7.62 antiaircraft machineguns which probably accounted for the hits our helicopters had to endure. Other major items found were 2 machineguns, 8 BARs, 38 rifles, 5 SMGs, 3 60-mm mortars, and 2 American PRC-10 radios.

We used up 53,500 rounds of 7.62 ammunition, 389 2.75 inch rockets, and 17,000 rounds of .50 caliber ammunition.

The old man told us at the critique that this operation was a good example of the help aircraft can give troops in blocking off avenues of retreat. In this particular case it would have been impossible to block the Viet Cong retreat by any other method.

It also proved the value of aircraft in a resupply mission. The Eagle Forces used all the ammunition they needed and were able to keep up a steady pressure on the enemy.

If you are wondering about the poor villagers, we found them hiding in a nearby woods. ARVN soldiers helped them rebuild their demolished homes and they returned to their former life as if nothing had happened – except that now they know why Vietnam is fighting.

Nine seriously wounded were evacuated to a hospital by ambulance helicopters

Camouflage and

Dispersion of Chinooks

Lieutenant John F. Gallup

CAMOUFLAGE is an old game. Ever since our aboriginal ancestor first popped a bush on his head to elude predatory neighbors it has been a technique for combat survival.

But the introduction of helicopters to the tactical environment has created new problems in camouflaging. This article is concerned with the *most appropriate* means and methods for camouflage of the CH-47 Chinook.

In 1958 the U. S. Army Engineers Research and Development Laboratories conducted tests dealing with camouflage of aircraft in temperate, tropical, desert and arctic terrain. Four observer-target situations were used: air-to-ground, ground-to-ground, air-to-air, and ground-to-air. These tests concluded that:

- Bright markings and glossy finish of the present standard paint scheme defeat camouflage, as do anticollision markings.
- Grey paint on the tops of main rotor blades defeats camouflage.
- Paint is the best camouflage material, particularly for helicopters, as the weight is less when compared with nets, drapes, etc. (Nets will be discussed later.)
- The best color for camouflaging aircraft with the least logistical burden is lusterless olive drab.
- Combination designs using more than one color add only marginally to the effectiveness of camouflage. If two colors are to be used the field pattern would be more effective, if the second color is black.
- To be effective, any camouflage paint scheme must be supplemented by other measures.
- Increased training is needed on basic camouflage principles in the field.

Weight is an important consideration where camouflage of any aircraft is involved and imposes stringent limitations on artificial materials. Additionally, the concepts of future warfare impose further limitations on the availability of such materials.

When he wrote this article, Lt Gallup was with Co B, 228th Aslt Spt Hel Bn, 11th Air Assault Division, Ft Benning, Ga.

Thus, it can be seen that paint offers the best camouflage potential for aircraft.

Little difference exists between the cost of permanent and temporary paints, and the time and labor involved in preparing and painting the aircraft is equal. Temporary paint can be removed if desired, but it also requires considerable spot painting if it is needed for prolonged periods. Removal requires considerable time and expense, and the scrubbing required in repeated removal of temporary paint results in heavy wear on the topcoat. This often necessitates permanent-type painting.

Since camouflage helicopters would be required for periods in excess of 3 months permanent camouflage paint would be less expensive.

The optimum color scheme for all helicopters, except those used in arctic terrain, is solid color lusterless olive drab, shade number 613, using lusterless black, shade number 37038, for required markings, and yellow color number 33538 for required caution markings. This color scheme has further advantage in that it can easily be modified to a field pattern if desired. Small caution markings may be used where required without materially affecting the camouflage scheme. However, such markings should be reduced to an absolute minimum, i.e., radio call numbers and small caution markings.

White in winter and olive drab in all other seasons are the optimum colors for arctic terrain.

Nothing precludes camouflage painting of helicopters (minus main and tail rotor blades) at organizational, direct support, or depot level. Vertol has stated that they do not recommend painting of the main rotor blades at lower than factory level.

TB AVN 7, "Painting and Marking of Army Aircraft," requires that the lower surface of all main rotor blades be finished lusterless black, shade number 37038, and that the upper surface of all metal blades be finished lusterless olive drab, ANA shade number 613. This TB further states that authorization to paint Army aircraft lusterless camouflage colors rests with the theater commander.

While there is general agreement that aircraft fuselages can be painted at organizational level, it is recognized that there will be better control and a more uniformly finished product if the painting is accomplished at the direct support level or higher, where more equipment and trained personnel are available.

Some things to be considered in painting are the time involved, the amount of material necessary, and the equipment and place to

perform the painting. Through past experience, it was found that this painting can be accomplished outside, providing it is not in a dusty area and not raining. The equipment necessary is just a spray gun and a compressor.

Approximately 4 to 5 gallons of paint, which is used with 12 to 15 gallons of paint thinner, are needed to paint a CH-47. The time involved is 45 manhours, from the time the aircraft is received until it is ready to return to this unit. This time includes preparation and painting the Chinook. The approximate figures are necessitated by paint loss in various wind conditions and because paint thinner evaporates faster when painting outside.

As a point of interest, the amount of paint used weighs approximately 42 pounds. This has no effect on the weight or balance of the aircraft.

Since forward and aft rotor blades must be painted at factory level, and to avoid confusion and establish uniformity, it is highly desirable that the entire camouflage painting be accomplished at this level with colors and types of paints to meet U. S. Army specifications. Trained personnel and proper equipment would be available to accomplish the job with far better results than what might be attained if accomplished at unit level.

Though paint is considered the most practical, this is not the only means of camouflaging aircraft. Some thought has been given to the use of camouflage nets of the type used in World War II for fixed wing aircraft.

The size of the Chinook and its weight limits any ground handling under tactical conditions after landing. Therefore, the nets would have to be draped over the aircraft after the blades had stopped turning. This would be very time consuming and almost impossible, due to the limited number of personnel within a Chinook battalion. It is also not practical, as the overall dimensions of the CH-47 are 100 feet in length and 55 feet in width. This, as you can imagine, would mean a number of nets of a size that could be handled.

The size net we will select for discussion is 29 feet by 29 feet and weighs 46 pounds. It would take eight such nets to cover the aircraft, which also means that these nets have to be transported with the aircraft at all times under tactical conditions. If we look at the weight from the standpoint of a battalion, it means 17,664 pounds additional weight to be transported. These are but a few of the disadvantages in using nets as the primary method of camouflage.

From a tactical standpoint camouflage of helicopters during the testing stages is highly desirable to lend realism to the situation. It would be even more advantageous to a unit deployed in actual combat operations.

Though camouflage is the main thing we are interested in, we must not forget that some dispersion is required. In dispersing the CH-47 an area of 150 feet by 100 feet is required for parking. To properly disperse the aircraft in a battalion, an area of 1 square mile is the minimum. Combined with camouflage painting, and as the tactical situation might dictate, dispersion of these helicopters should be along the treelines or in fields with some small undergrowth.

There must be new and increased emphasis on training of personnel in the principles of camouflage and dispersion in the field. This emphasis must come from the commander.

If we are to exploit the Chinook to its fullest, we must not deny it such a basic combat tool as proper camouflage.

WHY?

CWO John G. Foley

MANY OF US can remember not too many years ago when the only way for an aviator to obtain a protective helmet was to scrounge from the Air Force or Navy. After a few severe head injuries, R&D obtained the forerunner of the APH-5, ran tests and found that these new-fangled hardhats were in reality a useful item. They became mandatory issue to all aviators and crewmen.

This was a step in the right direction. Let's pursue the subject of protective clothing for airmen. The other services provide their aviation personnel with flight suits and jackets, gloves, and boots. These items are designed for safety and comfort, not to mention accessibility to hard to reach objects. Who among us doesn't recall wearing a shoulder harness over a pair of starched fatigues and the need to reach something in a shirt pocket? Has the pitch stick ever caught on a part of the regular GI gear you have worn in the cockpit?

How many of us have worn the Navy issue, gauntlet type flying gloves, and wondered why we hadn't had them before? No woolen inserts that just make for a bulky unfeeling hand, but thin and tight just as we want.

We have an exposure rate among the highest of any profession. Is it too much to ask that we be allowed to use clothing and equipment specifically designed for pilot and crew safety?

Flight Records Mechanization

Major George N. Stenehjem

HEY SAM, WHAT in blazes is this new form?" Capt Ort Hardland asked Lt Sam Jones. Captain Hardland had just returned from a tour overseas and had been assigned to the operations division as a replacement for Lieutenant Jones, soon to depart for Vietnam. The form he referred to was USAAVNC (759) (Mech) 6 July 64.

"That's your individual mechanized flight record," Lieutenant Jones stated laughingly. "It replaces the former manual DA Form 759 here at Rucker."

"Why?" Captain Hardland asked flatly. "If the old 759 is good enough for everyone else, why isn't it good enough for Fort Rucker?"

"Well," Jones countered, "first of all we're bigger, with more than 2,000 individual records to be maintained. Also, we have over 800 aircraft which are maintained and refueled by civilian contractors. This requires a lot of record keeping."

"So, what's that got to do with the price of eggs?" Hardland asked.

"Mechanization, man," Jones replied. "This form is used with a computer to record and maintain our flight records."

"Computer? Mechanization? Come on, Sam, remove the cloud formation."

"O.K.," Jones commented, "suppose I just fill you in on some of the growing pains."

"Shoot," Captain Hardland stated, his interest visibly showing now.

"Well," began Lieutenant Jones, "when I was first assigned to the school in April 1964, the mechanized system was in its infancy. Like any system, there were some early problems. However, everyone concerned simply got their heads together and ironed them out. It takes a powerful lot of coordination and teamwork to make a complex system like this work.

"It didn't take long," he continued, "to prove that the biggest responsibilities rests with you and me, the aviators. We must record accurate and readable information on the -12s and -13s — our name, serial number, mission code identifiers, discrepancies, POL, and time flown. Then this information will be punched onto electronic accounting machine (EAM) cards for the computer to record the data and provide us with accurate flight records.

"Two features really stand out in this mechanized system. The first involves a term I heard once —GIGO—which means 'garbage in —garbage out.' In other words, if you put garbage or incorrect data

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into the computer, you'll get garbage out. The second feature aviators noted," Sam continued, "was that you lose the so-called personal touch you had with the manual system. However, procedures have been refined so that an aviator can call Flight Records Branch (FRB) and get his question answered or his problem resolved."

"Very interesting, but you still haven't told me why the old 759 isn't used," Captain Hardland said.

"I'm coming to that. You see, with the manual 759 form some of the summary totals and aircraft qualifications data is on the reverse side. Typists had to manually interleave carbon before typing one side, remove the carbon, turn the forms over and again interleave the carbon before typing on the reverse side. The new form repositions all data on the front of the form. Two other things are necessary for computer processing, which are lacking in the 759: forms must have sprocket holes along each side for machine feeding, and they must be continuous."

"Whoa, buddy! My form isn't continuous and it has no sprocket holes," Captain Hardland said.

"That's right," Jones answered, "but forms are separated and the sprocket holes are trimmed by data processing machines before they are sent to Flight Records Branch for distribution."

He continued, "The exact procedure by which these 2,000 plus records are maintained requires the closest coordination and teamwork of all concerned. For instance, once the aviator has the necessary information on the DA Form 2408-12, contractor maintenance personnel collect them from the aircraft daily and deliver them to AG Flight Records Branch. FRB personnel code the flight information, punch the data onto cards and forward the cards to the data processing service center (DPSC). Machines in DPSC update daily each aviator's flight record file so that required mechanized reports can be developed on a closely timed schedule. This same process is repeated each day with a volume of nearly 1,500 -12s, which result in as many as 4,000 cards to be punched daily, or about 75,000 monthly.

"You can see," Lieutenant Jones continued, "that any faulty scheduling or careless recording of information could seriously hamper this closely timed schedule and could affect all interested activities, as well as the aviator. Take a graduating class of 100 student aviators for example. AG must process all their flight and personnel records. DPSC must complete their aviator flight records and personnel records, determine each aviator's entitlement to flight pay and must complete pay action—all in an extremely short time. When you consider that at least one class, either initial entry or transition, graduates weekly, you can begin to appreciate the volume in this category alone."

"Did you say this computer also determines each aviator's entitlement to flight pay?" Captain Hardland asked quizzically.

"Sure, this is another of the by-products of the computer system. The machines place all cards pertaining to each aviator together, add them up, determine which aviators have qualified for flight pay, and list them. Another feature of the system is that the command can determine, almost instantaneously, the qualifications of each aviator, by name, grade, total hours flown, type and series aircraft in which qualified, and whether instrument or instructor pilot qualified. A further advantage is that reports are generated by type aircraft, mission, class, and fleet ownership."

Lieutenant Jones continued, "Only recently the Aviation Center and USABAAR have developed aircraft accident geographical and statistical data on all Aviators. Possibly to be incorporated into this system is a proposed worldwide aviator qualification data bank which would provide Fort Rucker as well as other activities of the Army with aviator personnel information."

Captain Hardland said, "I just reviewed my personal records at DA. It appears that their present system for determining current aviator qualifications is extremely limited and outdated, since the source data for aviator qualifications is the Form 66, Personnel Records. For instance, my Form 66 has the fact that I am UH-1 qualified. It also has given me credit separately for instructor pilot time. But it fails to depict the fact that I am an instructor pilot with over 500 hours in the UH-1. Nor does it show that I have become further qualified in the UH-1B and D models within the past year. It would appear that the proposed worldwide qualification data bank would fill the bill.

"Assignment officers at DA and in the field stated that this is the kind of aviator data they need, particularly with increased costs of training aviators in such aircraft as the OV-1, CV-2 and CH-47. The Army's personnel resources are becoming more critical and better use will have to be made of aviator personnel."

Captain Hardland concluded, "You know, Sam, I can surely appreciate this new mechanized records system now that I have an insight into it. I can also see why it is so essential to keep track of aviators since we are one of the most expensive specialists in the Army."

UH-1 Power Checks

Captain Joe K. Bell

RECENTLY I made a survey of Iroquois drivers, maintenance supervisors, and platform instructors. None of these professionals were familiar with making a complete inflight power check on the UH-1 helicopter. Are you?

This lack of familiarization was not caused by lack of interest. The problem, it seems, lies with TM 55-1520-211-10 and -20 — no complete instruction. It is recognized that few of us will kick the tire, light the fire and blast off. At the present that is about the story on the UH-1 Iroquois.

Aviator and mechanic alike must realize that each engine has its individual characteristics and operating limitations. Information on a particular engine can be found in the historical records. Data necessary to perform power checks will be found in the engine historical records, table I, and the fuel control bias curve. Table I will give the N_1 speed at which the manufacturer guarantees rated power. The fuel control bias curve will allow for temperature correction.

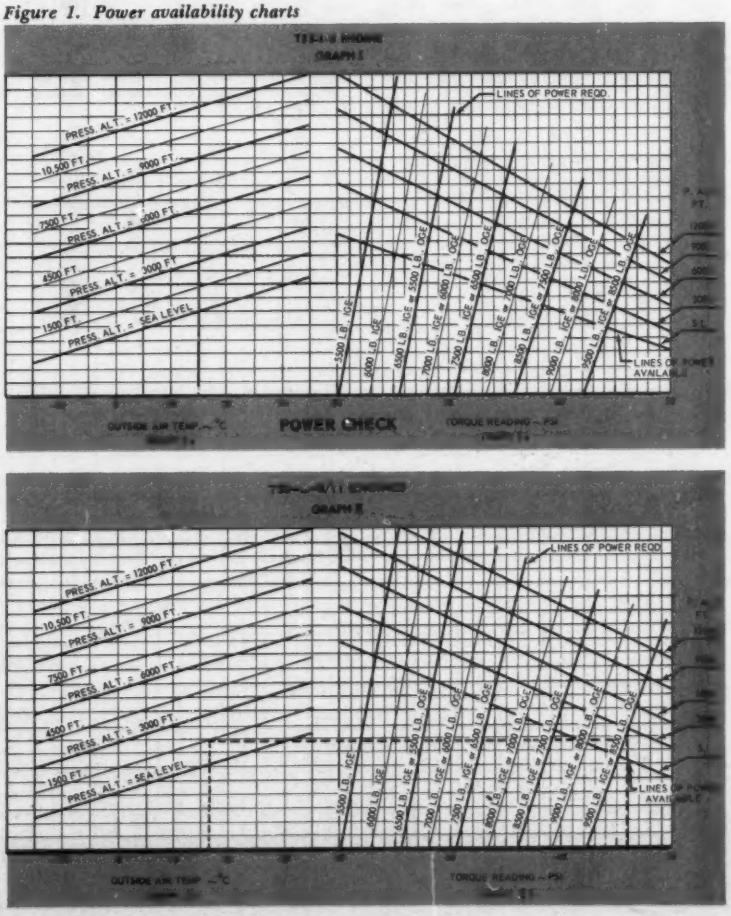
First let's go through a power check under field conditions. Information gathered here will be the average power which all engines are capable of producing. It will be found in terms of maximum torque pressure under operating limits of the engine.

To make this check, enter a full power climb at about 60 knots. On substandard days, make this check at sufficient altitude to prevent overtorque. Do not exceed 50 psi torque for UH-1B and -1D and 34 psi for the UH-1A. With maximum power applied (that is at that point where additional power application would cause loss of N_2 rpm) observe and record the torquemeter, torque pressure, out-side air temperature, and pressure altitude. (A practice run through a selected altitude will assist in accurate temperature reading.) Assuming that the observed conditions for the power check were torque pressure, 47 psi, OAT, 17° C, pressure altitude 1,500 feet, the power available can be checked by use of the power availability chart, figure III. (A similar chart can be found in section II, chapter 14 of the -10.)

Enter the chart at the test OAT (17° C) and proceed vertically to the pressure altitude (1,500 feet) and then horizontally to the corresponding altitude scale on the right hand side of the chart. From this point, move vertically to the torque pressure scale at the bottom for maximum torque available. Since the reading is 46 psi torque for the average engine, the test engine exceeds the guaranteed power.

For a more accurate performance check, refer to table I from the engine historical records, figure I. This data will provide the maximum performance record of your particular engine. To perform this check, enter a full power climb and pull the maximum N_1 power available by application of collective pitch until an N_2 rpm drop is observed. Check N_1 speed and increase collective pitch until approximately 200 less N_2 rpm is obtained. If the N_1 speed has remained the same (be sure to use the vernier N_1 dial), the engine is operating at its maximum N_1 speed. Record maxi-

Figure 1. Power availability charts



Capt Bell is the Operations Training Officer, Dept of Maintenance, USAAVNS, Ft Rucker, Ala.

TABLE 1

T53 -L- 9 ENGINE S/N LE06123

THIS ENGINE WILL PRODUCE GUARANTEED TAKE OFF RATED POWER AT 97.1 %NI SPEED WITH A 1060 °F EXHAUST GAS TEMPERATURE UNDER STANDARD DAY SEA LEVEL CONDITIONS.

THIS ENGINE HAS SATISFACTORILY DEMONSTRATED COMPLIANCE WITH THE PERFORMANCE REQUIREMENTS OF THE FINAL RUN AS SPECIFIED BY MODEL SPECIFICATION 104.22-B ON 8-14-62 (DATE)

Andrew Amatuzio
TEST ENGINEER

8-15-62
DATE

ROUTINE E
OIL SPEC.
HOT OIL IN
STAND
DATE

mum N_1 speed and OAT at the test conditions.

Consult table I and find the takeoff power N_1 speed for standard day conditions and record this value (example, 97.1 percent) since test data was other than standard (maximum N_1 96.9 percent at +17° OAT) consult the fuel control bias curve, figure 2, and apply the temperature factor. *Figure 2.*

To apply temperature factors, enter the bias curve at the recorded OAT (+17° C) and proceed vertically to the takeoff N_1 curve, then horizontally left to obtain the deviation in regulated gas producer speed (–0.2 percent) to be applied to the standard day N_1 speed for takeoff power.

It should look like this:

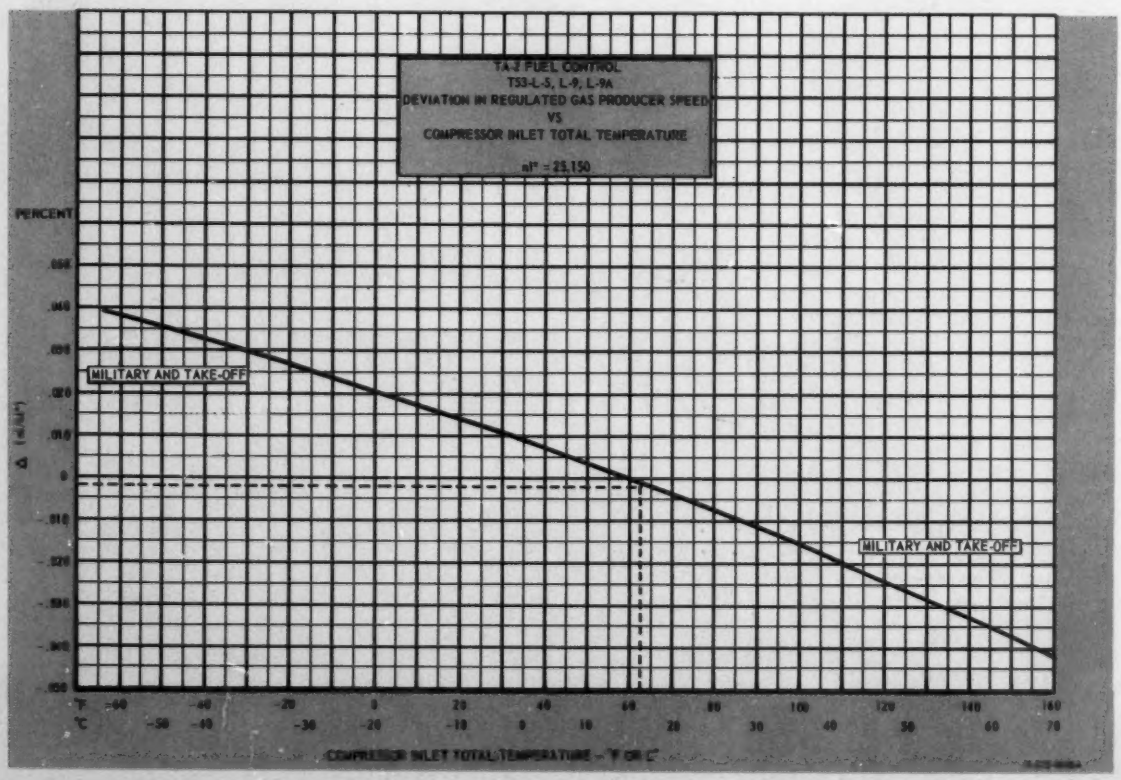
Takeoff power, N_1 speed, standard day (table I)	= 97.1%
Deviation to N_1 speed, temperature (bias curve)	= –0.2
Maximum attainable N_1 speed test condition	96.9%

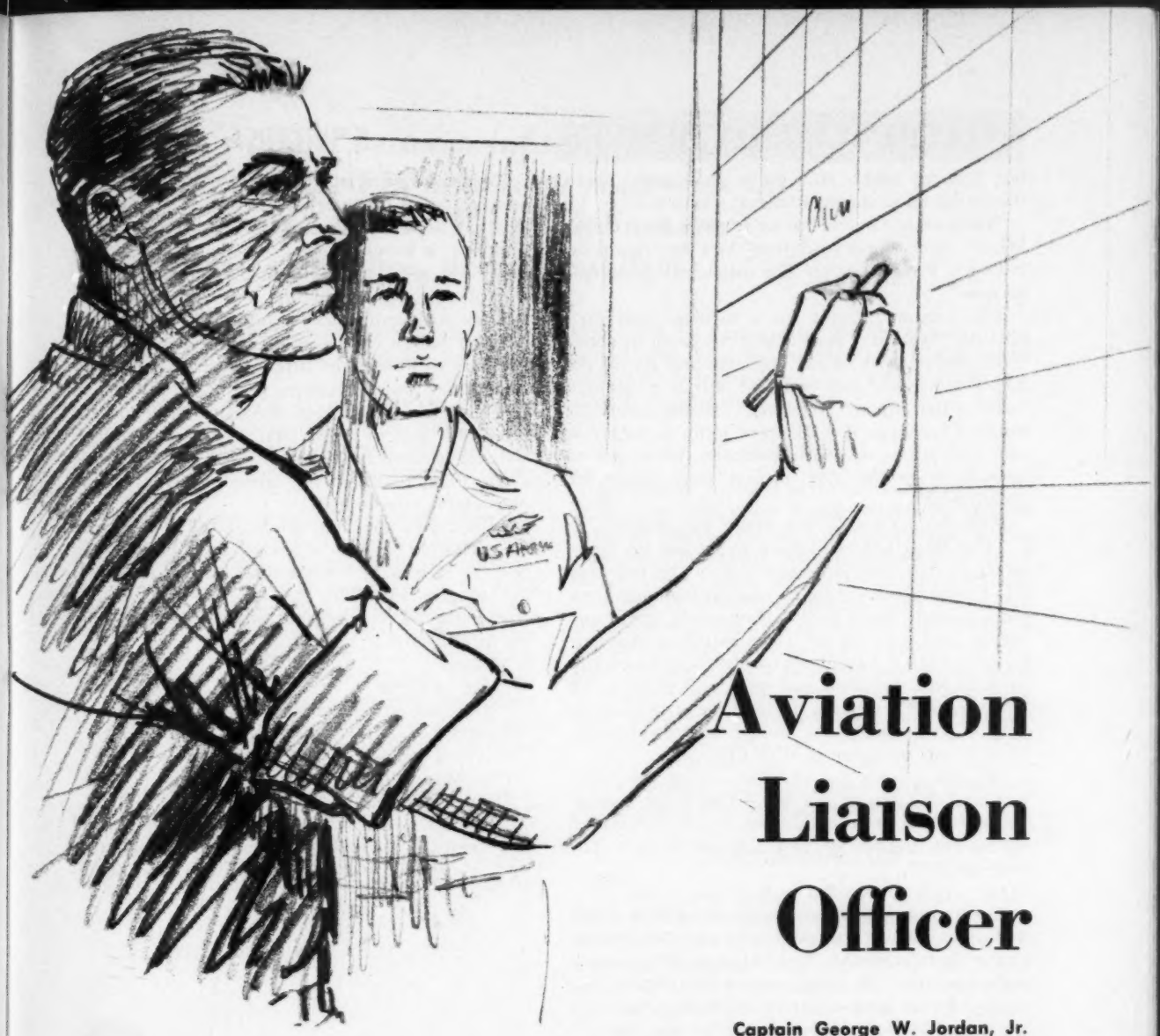
If the actual N_1 does not conform to the computed maximum speed, appropriate adjustments must be made on the fuel control unit. If the test N_1 speed exceeds that given in table I, headaches are forthcoming. The EGT will run higher, probably shortening engine life due to overspeeding.

Remember:

- The N_1 tach is the most important power instrument in the helicopter; and a loss of 1 percent N_1 speed is comparable to 450 pounds lift capability.
- One psi torque is worth 200 pounds lift capability.

Figures referred to are from Bell Helicopter Company's publication "Know Your Iroquois."





Aviation Liaison Officer

Captain George W. Jordan, Jr.

TEMPO IN INFANTRY Battalion Operations was clearly up at half past midnight. Fatigue induced by the long day had suddenly vanished and all personnel were operating with cool, professional dispatch. Major Gerda, the S-3, looked up from the candle illuminated source of the timely activity and reflected on the order: ASSAULT . . . ONE COMPANY . . . NIGHT . . . HELIBORNE!

A jeep squeaked to a stop outside the tent. The canvas flaps of the tent rustled open and quickly closed again.

"Oh, good evening, sir," Sergeant Grogan said as he turned from the situation map. "Major Gerda, Captain Jordan is here."

The gold leaf reflected the dim light as Gerda stood and smiled, "Evening, George. Have you seen the old man's order?"

"Only to scan it, sir. I wanted to get over here as soon as possible. Who's in the fish bowl?"

With a confident grin Major Gerda answered, "Bob Jackson and his 'Bravo Bullies.' How are you going to work the air end?"

"We work for you," said the captain in the green flight suit. "We worked with Bob's Second Platoon

last Tuesday night. He's got a good unit. There should be no problem, whatever you want."

"Yeah, yeah, I know; but we've got to get crackin'. What's *your* recommendation? You can figure on having a TAC prestrike. The colonel is laying that on now."

The aviator thought for a moment and then advised, "Well, our pathfinders can jump in about 1,000 meters south of the objective and set up the LZ. Tentatively, they will set up in a platoon heavy lift/company diamond, landing generally north. Of course, if a different setup is required, they will advise us at the company. We've got to be sure to let the TAC jockeys know about the pathfinders."

"OK. Sounds good. How about the pickup?"

"The Bully boys will have to set the PZ themselves in that open area just east of the company CP. Have them set it up in platoon diamond/company column. We'll land yellow, white, green and orange and will be on your battalion alternate frequency—50.2. I think we can be there for pickup by 0145 with no sweat and we'll pull pitch to hit whatever TOT you say. If you'll get this poop to Bob, I'll go right on back and get my crews briefed. What's your latest enemy SITREP?"

"I'll get a fresh one and have it for you when you land. See you at four five." The major nodded approvingly as he sat back down, lit his pipe, picked up his hot line and asked for Bravo Bully 6. The time was 0035. . .

• • •

As you and the aviator bounce along back to the helicopter laager area, you ponder the coordination you've just witnessed. Five minutes of planning, night operation, 20 helicopters to be airborne in a little over an hour—military force or *farce*? The question bugs you, "What would be the result in my unit?"

The answer to this question depends basically on rapport. In this case, rapport between the infantry and the aviation unit, with the primary responsibility for its attainment resting with the aviation liaison officer. To such harmony, the aviation liaison officer's guidelines are

- knowledge,
- assistance, and
- professionalism.

When he wrote this article Capt Jordan was serving with Co A, 229th Aslt Hel Bn TF, 11th Air Assault Division, in the Dominican Republic.

KNOWLEDGE

The exchange of information as to unit capability and limitation is usually accomplished through the aviation liaison officer and the infantry unit S-3. However, it should *not* be considered a "two way street," if for no other reason than the simple gesture of relieving the infantry S of the requirement to keep still another party informed. Instead, the aviation liaison officer should make it his business not only to inform the supported unit of aviation capabilities and techniques and assist in mission planning, but also to keep *himself* informed of the infantry's present operations and future plans. Valuable time by both units is saved by formulating sound plans based on the immediate transmission of available information.

Armed with such an attitude, the aviation liaison officer begins his task of giving and obtaining all possible information concerning his own unit and the infantry unit. This is a never-ending task but among the more important answers to seek from the infantry are:

Mission
Order of battle
Unit organization and SOPs
Location of units
Chain of command
Communications means and data
Unit evaluation

The infantryman should know and understand the forelisted information regarding the aviation unit. He should also be familiar with its capabili-

Effective rapport between infantry and aviation units engaged in a mission rests with the aviation liaison officer. His guidelines are knowledge, assistance, professionalism.

ties, techniques, terminology, inherent problems—in short, he should have as complete a knowledge of aviation as possible.

Therefore, it is now obvious that the 5-minute coordination session in the opening situation was actually the culmination of many hours of work and training resulting in mutual trust and understanding.

The achievement of the training status advocated is based on the efforts of an eager and enthusiastic aviation liaison officer. Normally, the optimum results and economy of force is achieved on the ratio of one aviation liaison officer per infantry battalion. On a broader scale, where several infantry brigades are involved, an organization of aviation liaison officers solves the problem. For instance, in a division with two infantry brigades and two assault helicopter battalions, one method of organization might be one of the aviation battalions in direct support of one specific brigade.

The further breakdown may assign A, B, and C companies of the aviation battalion to the 1st, 2d, and 3d battalions of the brigade, respectively. Finally, it is sometimes advantageous to further assign platoon leaders of the aviation companies for direct liaison duties with specific infantry companies. This final assignment is not always necessary, but where personnel are available it will save time in the long run.

ASSISTANCE

Attitude is the focal point of this guideline. As is the case with every branch of service, aviation exists to support the man on the ground—in this case the infantryman. With this thought in mind, the aviation liaison officer should approach the problems of assisting supported units. He should remember that the aviation portion of a mission is but one of many portions of the infantry S-3's concern. Therefore, the aviation liaison officer should be prepared to advise the S-3 on a clear, concise plan when the operations officer calls for it. In delivering this plan, an attitude of flexibility should be maintained. The plan should be considered a starter, which with modifications mutually agreed upon, may be rapidly finalized.

PROFESSIONALISM

In this axiom, proper economy of force, equipment, tactics, administrative and logistical details, safety and all other items which ensure mission success with minimum losses of personnel and equipment are jelled. This is the payoff—the report card—of how well the aviation liaison officer has oriented the infantry. If properly oriented, the S-3 will probably desire an aviation plan which reflects aviation considerations and common sense comparable to those of the most experienced aviation commander.

If, however, for one reason or another infantry planning does not reflect important aviation considerations which could be corrected without affecting the success of the mission, it is now the job of the aviation liaison officer to correct and professionalize the situation for the benefit of both elements. In this regard, one thing is fairly sure: advice from a stranger won't be well taken. So, aviation liaison officer, if you haven't already tied in, you're late.

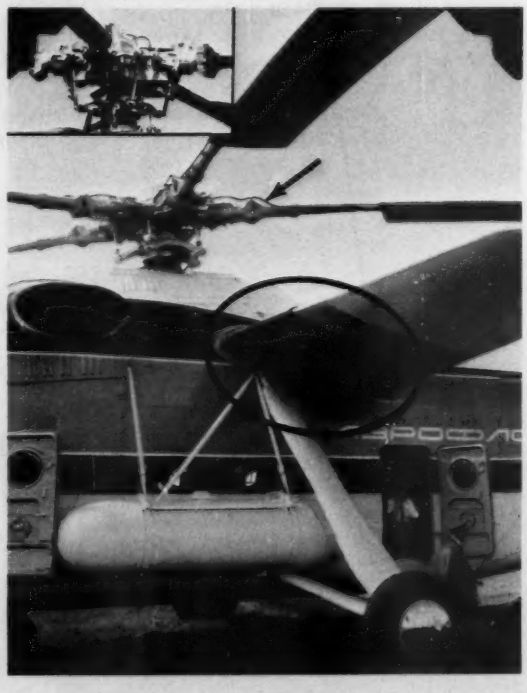
Pilot's Scrapbook

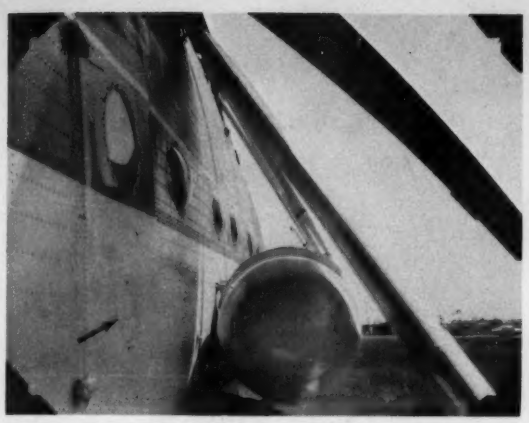
THE MI-6 "Hook" and MI-10 "Harke" helicopters were among various aircraft the Soviet Union displayed at the 26th Salon Internationale de l'Aeonautique et de l'Espace (Paris Air Show) last summer. Captain Paul W. Bass of the U. S. Army Aviation Test Board, Fort Rucker, Ala., attended with a U. S. Army team and took some pictures revealing details of the Hook and Harke. These photos are taken from his scrapbook.

The MI-6 first appeared in 1957 as the largest helicopter in the world. In 1961 the Soviet Union unveiled the MI-10, a flying crane which evolved from the Hook. Most noticeable differences are the reduction in the depth of the fuselage, "stilt type" legs, and the absence of the stub wing on the MI-10.

	MI-6	*MI-10*
Length	122′ 6″	120′
Height	30′	150′
Rotor diameter	120′	120′
Weight:		
Max t/o	93,713 lb	94,815
Normal t/o	89,303 lb	——
Speed	162 kt (max)	108 kt (w/o load) 97 kt (w/platform load)
Engines	2 TB-2BM gas turbines at 5500 shp each	2 TB-2BM gas turbines at 5500 shp each
SVC Ceiling	14,765 ft	9,840 ft

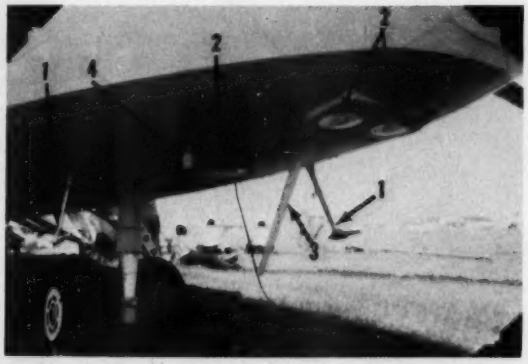
Man leaning on MI-6 wheel indicates size of tire. A heat shield (circle) offers protection from the turbine exhaust. Note electrical deicing cables (arrow) for main rotor; also the similarity between rotor head assembly and CH-34 Sikorsky (inset) rotor head assembly.





View of MI-6 fuel tank hookup and strut. It appears the MI-6's fuel system has been supplemented with external tanks which may be capable of breaking away in event of a crash. Windows bulging out allow a better view but "dirty" the aircraft aerodynamically— indicating that speed is not the primary design consideration. Note covered hole in door (arrow). This appears on all doors and may be a gun port.

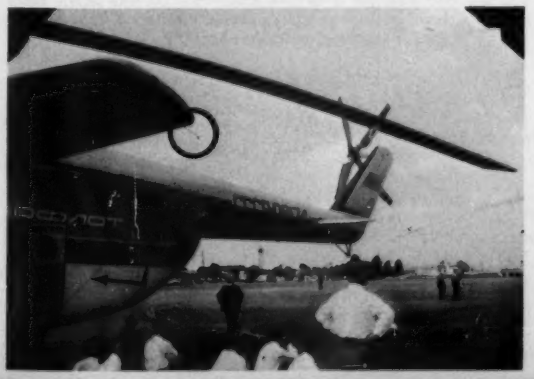
The MI-10 also has external fuel tanks and electrical cables for main rotor deicing. Man near wheel indicates size of tire. Note built-in crew ladder to door and engine cowlings forming work platforms which are said to be hydraulically operated. Flare tubes (arrow) appear forward of the door.



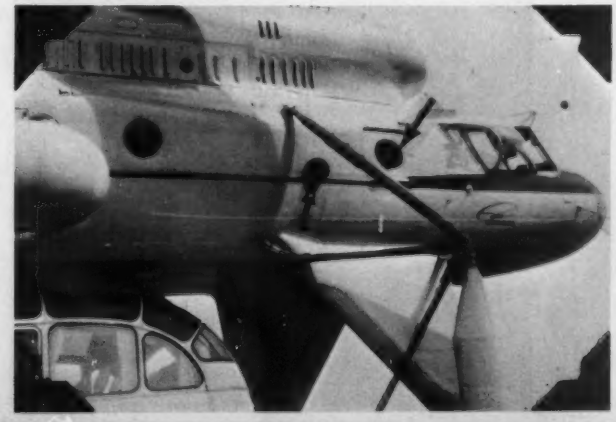
Points of interest include dual wheels on nose gear to enhance operations on soft terrain, dual pitot tubes (1), light arrangements (2), the antenna (3), and weight for trailing wire antenna (4).

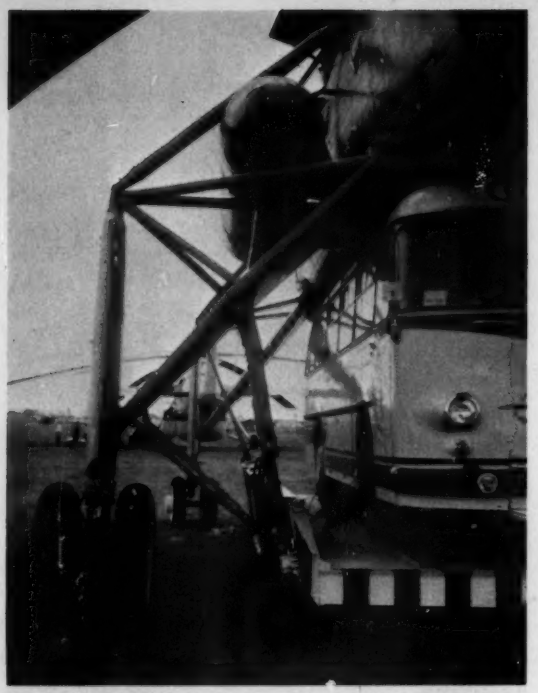
MI-10 rotor head. Man sitting on top indicates size. Windows bulge out as with MI-6.

Horizontal stabilizer is adjustable (also on the MI-10). The MI-6 has a tail skid and (although not visible here) riveted leading edges on the tail rotor blades. A static dissipator (circle) is visible on the stub wing which also has high stressed skin. Also note clamshell doors (arrows).



Note clearance between bus Airscoop and MI-10 fuselage; also APU outlet and exhaust (arrows).



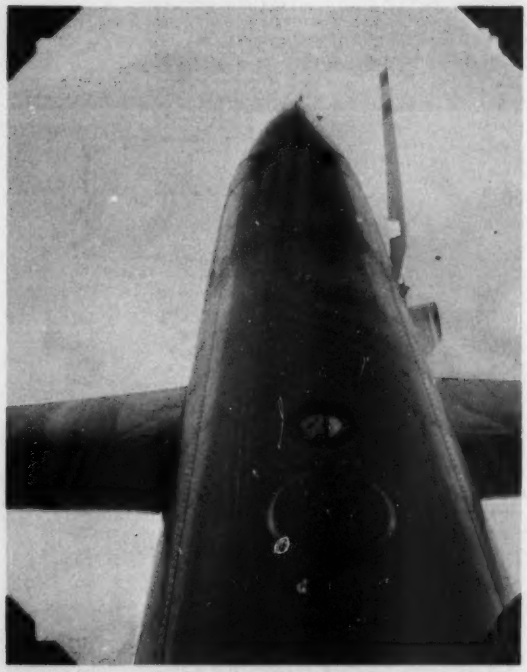


MI-10 wheels are offset with front wheels capable of swiveling.

Middle: Note hydraulic jacking arrangement for cargo platform and method of securing bus.

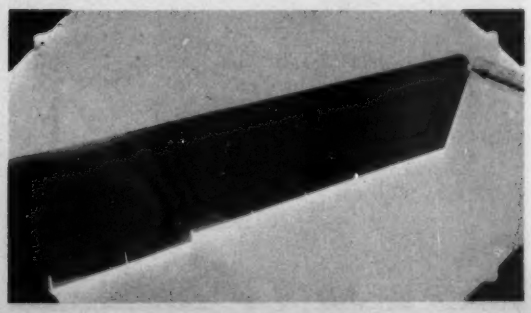
Bottom: A close look at the front lifting bar attached to the cargo platform.

Dual lights are arranged on the starboard side of the MI-10, which also is equipped with dual pitot tubes. Also note the transparent bottom.



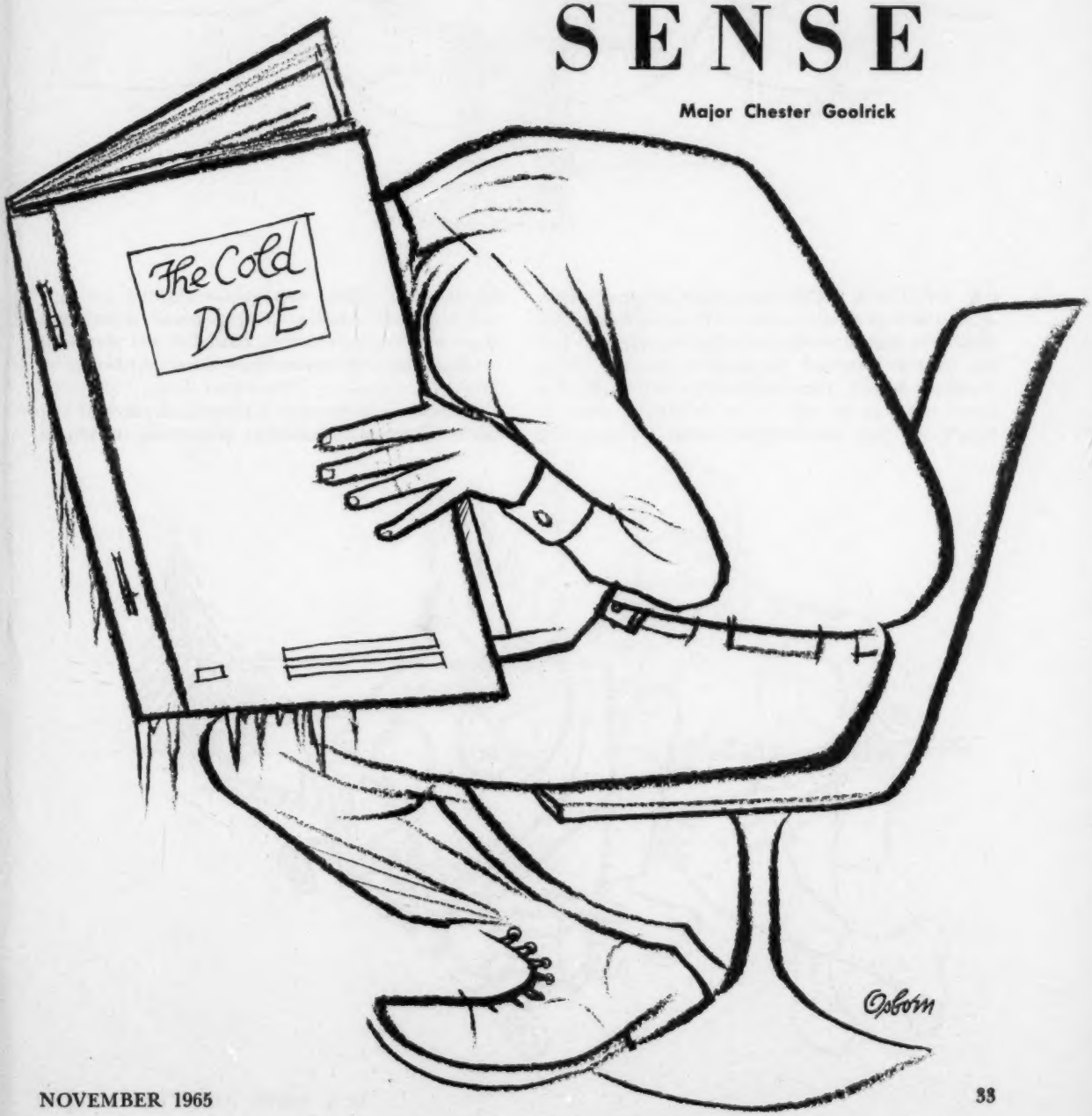
The aft external light is near a bulging hatch that may house TV equipment.

Pockets and deicing strip are noticeable on the main rotor blade. A small transparent area (arrow) houses a light and may be used for tracking or station keeping.



By-the-Book SENSE

Major Chester Goolrick

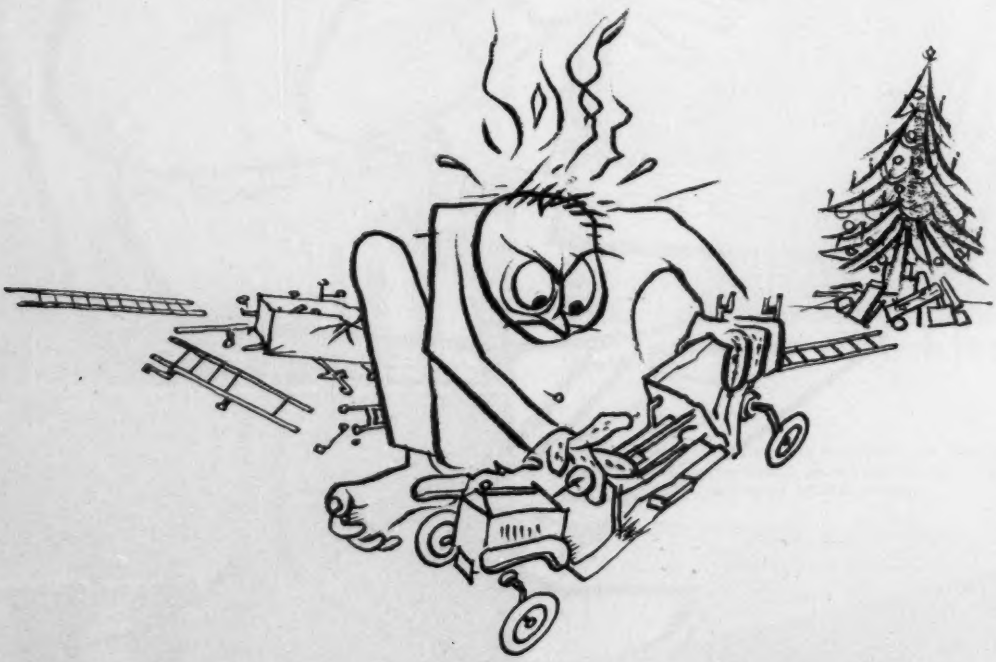


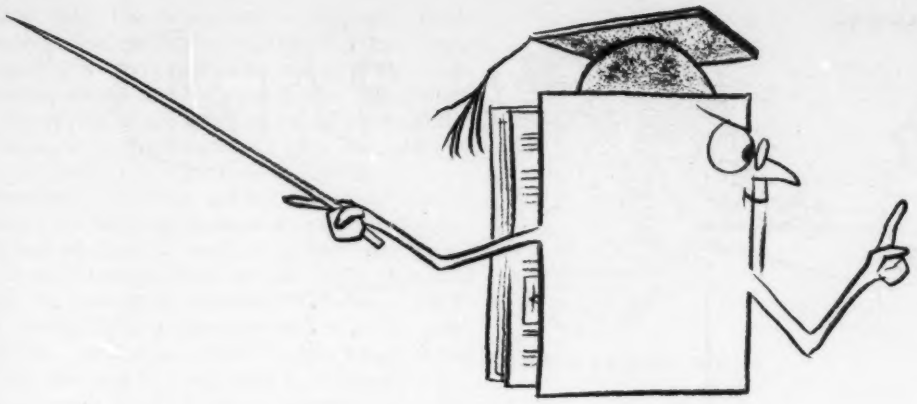
crash sense

AS EVEN A RANK tenderfoot can appreciate, it is a poor idea to set off on an expedition across the Sahara without a reliable map, vouched for by the National Geographic Society. Abdul Abulbul Ameer, your faithful guide, might not know the way as well as he thinks he does, in which case you wind up in a situation not even Lawrence of Arabia would have enjoyed.

Every bride starting to keep house is well advised to have a cookbook handy if she wants to prolong the honeymoon past the regulation two weeks.

And when a harassed father undertakes at the last minute on Christmas Eve to assemble the minia-

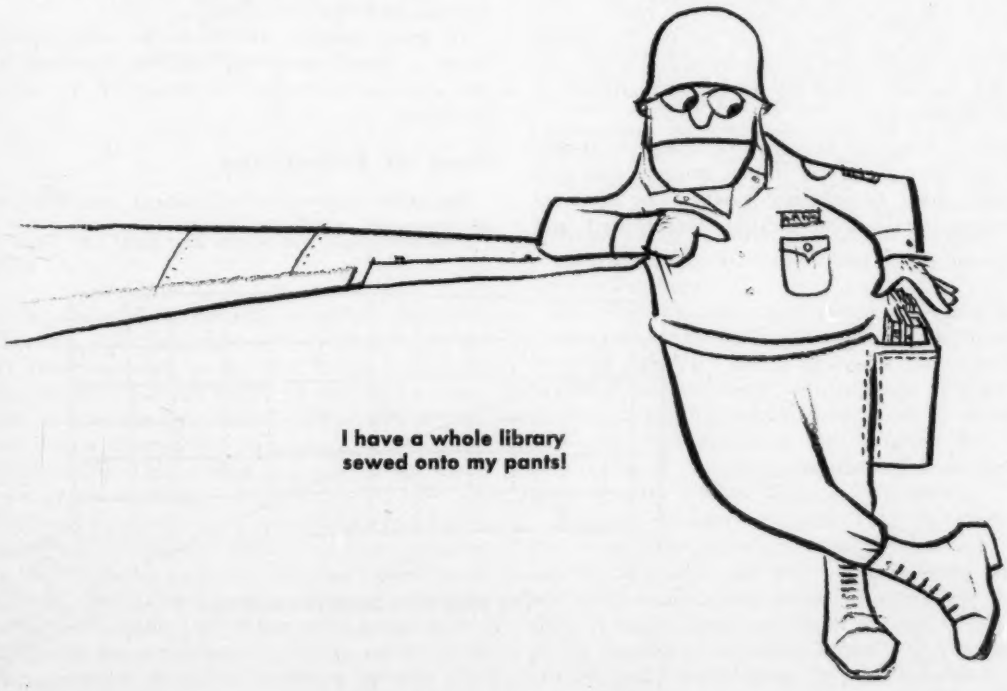




ture fire truck Santa has put under the tree, a set of instructions telling how to put tab A into slot B can make the difference between a toy Junior will be proud of when he wakes up and something resembling a small automobile graveyard.

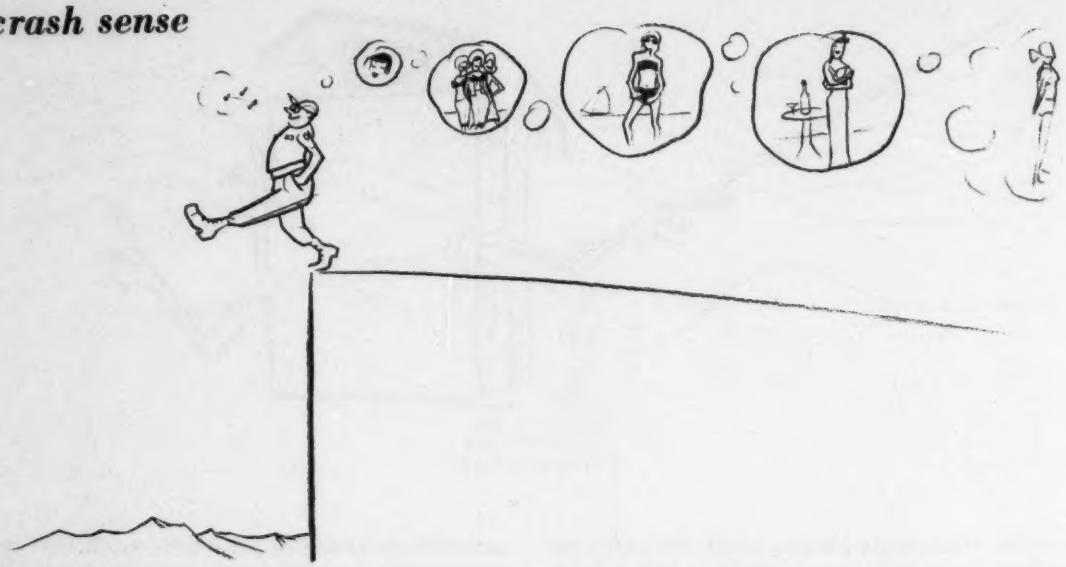
All of us, in fact, run into situations every day in which trustworthy, A-to-Z directions are either advisable or necessary. In other words, for just about every form of human activity from hopscotch to defusing hydrogen bombs there is a book to go by—a book designed by experts with one purpose alone, to make things

clearer,
easier, and foolproof.



I have a whole library sewed onto my pants!

crash sense



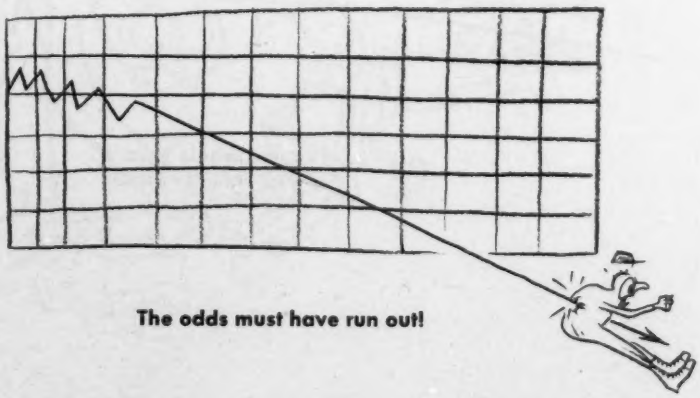
The book's real importance, the degree to which you follow it or ignore it, *depends on what you have in mind and what is at stake.* If you have no deep feelings about winning or losing you can pass on fourth down and still live to a ripe old age, provided you aren't strangled by the coach. Flipping a coin is as good a way as any to decide which fork in the road to take on a day when you had just as soon wind up in East Hemstitch as Lower Scuffletown.

When it comes to servicing or flying Army aircraft you are a long way from hopscotch and considerably closer to defusing bombs. The tasks involved are usually long, tedious, complicated, and require the kind of expert, meticulous attention to detail and proper procedures a top-flight surgeon put into an open-heart operation. The price per mistake can be considerably higher than a stubbed toe—considerably higher, in fact, than a custom-built Rolls Royce limousine.

In Army Aviation, the book—*for every aspect of flying or handling aircraft*—can be dispensed with just about as safely as a skydiver can do without his chute.

Book of Knowledge

Books for important and critical procedures will be necessary until the human brain can be fed



The odds must have run out!

processed data, like tapes into a computer. Even computers occasionally blow a fuse and feed back recipes for strawberry shortcake instead of the complicated equations they were asked for. The human brain is capable of all kinds of things a computer can't do, such as thinking about girls, but when it comes to feedback it is even more fallible.

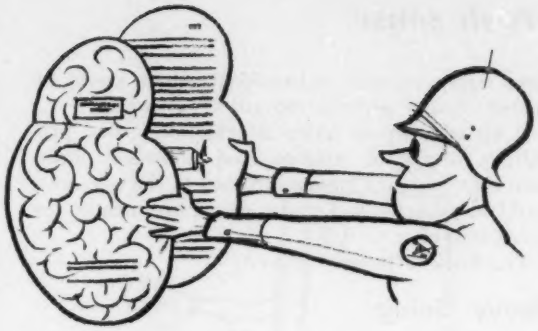
An appreciation of this sad but simple fact should be part of the basic equipment of every intelligent, highly trained man. In Army Aviation circles, every pilot or maintenance man should know that the -10, -20, the handbook, standard procedures, THE BOOK—whatever you choose to call it—is the only real failsafe device to ensure a job being done *every time* the way it is supposed to be done.

Get that every time bit, chums. As everybody who has ever tried it knows—and most of us have tried it at one time or another, particularly when we were young and tender and had ourselves confused

The book can lead you along the straight and narrow . . .

with Superman—it is possible to violate the book deliberately and get away with it. Sometimes. As every two-time loser in the Big House would be happy to tell you, if you keep on breaking the rules, sooner or later the long arm of the law will put the collar on you. Eventually you are sure to get all the trouble you've been asking for, with a lot more thrown in free of charge.

The book exists to keep a trained man in a hurry from the memory lapses anybody can have, particularly if he is under pressure. Who isn't these days? While we are talking about memory, it's possible for a man to acquire a set of memories *which aren't so* unless he has a reference in black and white to set him straight. If you've somehow become convinced that George Washington was a staunch supporter of George III or that Robert E. Lee won the battle of Gettysburg, you're going to have a tough time passing a history quiz unless you dip into a textbook for a check.



Look! A book like a brain

The book is also protection against another human failing about as universal as the common cold—the use of poor judgment. If you happen to have documentary proof that you are a reincarnation of King Solomon you are better off than the rest of us. Even so, left to yourself, one of these days you are sure to make a faulty decision. Perhaps the information you have to go on isn't as full as it should be. Just perhaps—and here is another common human failing—you have developed an appreciation of your own abilities which is considerably higher than simple honesty would allow. If you will give it a chance, the book can take you gently by the hand and lead you along the straight and narrow, to see that you stay on the path until you are home free without wandering off into quicksand on your own.

As everybody is also well aware, there is a lot of quicksand around in Army Aviation. More is piling up every day. Very few of us would like to go back to the horse and buggy era and tell Wilbur and Orville to drop the whole thing, even if we could. It is true just the same that aviation has been growing more and more complicated and demanding ever since the first flight at Kitty Hawk.

The process hasn't stopped. Take the matter of the -10 on any modern aircraft, for instance. During World War II, the P-47 was one of the hottest and most sophisticated pieces of machinery in the skies. It had a handbook about the size of the telephone directory at Punkin Corner. Any respectable aircraft today would hang its head for shame if it

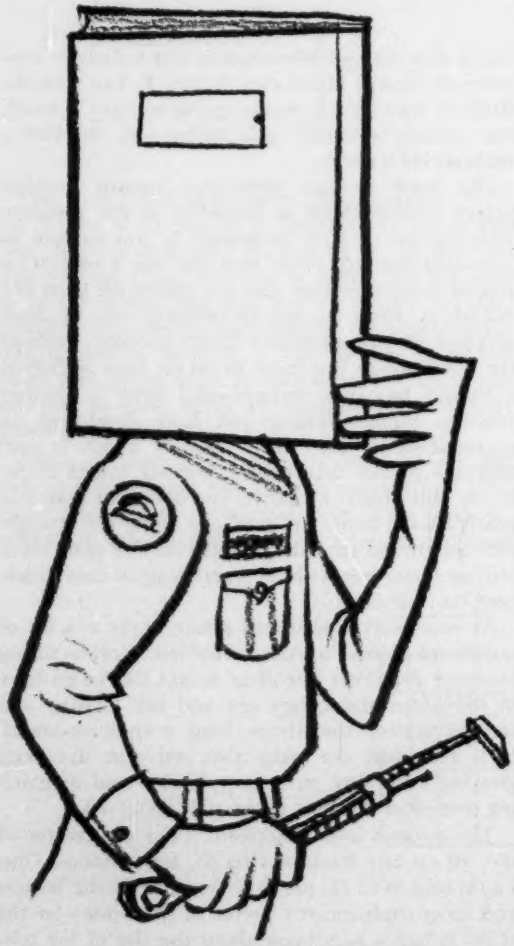
came equipped with a handbook which could be loaded aboard without the aid of a forklift.

It all adds up to more information, rules, procedures, words of wisdom, and household hints than even Jojo, the two-headed boy in the sideshow, could be expected to keep on file in his memory for handy reference.

The Book is the only answer.

Heavy Going

The trouble is, it is not an answer everybody listens to—not even veteran pilots and maintenance men who have been around long enough to know better. For one thing, no handbook is the kind of reading you'd want to take along on your vacation to dip into while you are lying in the hammock with a tall glass of something cool. No producer has ever seriously considered making one into a gripping Hollywood epic starring Rock Hudson and Sophia Loren. As far as plot and action are concerned, a handbook ranks somewhere just below the annual report of the Black Angus Cattle Breeders Association. It is long, dull, complicated, and about as easy to find your way around in as the jungle in the back reaches of the Congo. It is easy to avoid.



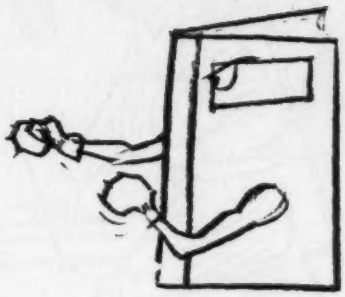
The book is the only answer!

What happens all too often is that impatience sets in. A mechanic servicing an aircraft begins to fall back on his memory, to tell himself he recalls a particular procedure because, whether or not he knows it, he wants to avoid the time and trouble of wading through a lot of fine print to make sure. This is the sort of thing which occasionally causes people after their house has gone up in smoke to wish they had read a little further down in the policy they bought from the slick-talking salesman who applied at the back door.

Or a pilot, pressed for time, fails to follow the preflight the book calls for because he really thinks he has it all down in his head. One example should suffice for the thoughtful. A pilot, copilot, and four passengers were all killed in a Choctaw crash a year or so ago when the automatic stabilization equipment engaged in flight while the ASE motor control was in a ground test position, putting the aircraft in a nonrecoverable attitude. A simple check of the sort the book called for for *that kind of aircraft* would have saved six lives.

Easily avoided? Sure. There is where the real tragedy lies. For one thing, in this particular accident, the pilot had not completed a proper preflight, which is just about rule one in any sensible aviator's book. You can almost always pinpoint a specific and easily avoidable cause for *any* accident which has happened because the book has been overlooked or, worse, deliberately avoided. When a Sioux pilot fails to move his battery aft to compensate for a passenger, he is violating the book and it should come as no surprise if his copter comes to rest like a kneeling elephant. If a pilot fails to check his gross weight with his performance chart he is likely to end up with the sensation that he is trying to fly Grant's Tomb. If a mechanic fails to torque a bolt properly, or skips an essential procedure, somebody is going to have to pay the piper.

And—provided he is still alive—there is always a



If a mechanic fails to torque a bolt properly, or skips an essential procedure, somebody is going to have to pay the piper

guilty party, some poor soul who has to face life knowing he caused a crash because he relied on his faulty memory or judgment to do something the book would have told him was wrong.

It is not the sort of thing you like to have crowding in on you on nights you can't get to sleep.

Road to Hell

Everybody in Army Aviation—in fact, most people everywhere, with the exception of assorted confidence men who make a living separating little old ladies from their money—operate all the time with the best of intentions. Good intentions by themselves are highly commendable when you are asking for a young lady's hand in marriage, or volunteering to teach Sunday School. When it comes to flying or servicing Army aircraft—or in any other phase of Army Aviation—they don't quite fill the bill. By-guess-and-by-God methods done with the best will in the world might have worked fine back in the days of the covered wagon. In today's world, they are as dangerous as a brace of Bengal tigers.

People who operate in this well-meaning but unorganized fashion probably never really have given much thought to what the book really is. They would never consider trying to tie their shoe laces with a monkey wrench or opening a beer bottle with their teeth if there is an opener at hand. They've known since infancy that a key is highly useful when you want to get in the house without battering down the front door.

Yet these same people can fail to appreciate that when all is said and done the book for any phase of Army Aviation's activities is a *tool,* to be used for a specific purpose just like wrenches, bottle openers and keys. They will never become true book lovers until they have absorbed the basics of bookmanship, that it falls into three basic categories:

crash sense

More important than my knapsack

The human factor
Equipment, and
Operations
And, above all, that

IT CANNOT BE OVERLOOKED

To be sure, as we are all aware, it is hardly feasible for a pilot to have the book in his lap for handy reference when he is practicing barrier landings. Everybody faces an emergency occasionally which calls for all the instinct, training, good judgment and horse sense he has at his command. Emergencies, however, have a way of being a lot less hairy for the pilot who knows, respects, and *uses* the book as a piece of helpful and necessary equipment which fits into his scheme of life along with his toothbrush and his power mower. He may not have it in his hip pocket when he is suddenly confronted with a strip with more obstacles than a steeplechase course. He could quote it to you, chapter and verse. He knows what to do and he does it.

If he doesn't know his book, or has never bothered to assess its total importance, he finds himself up the creek when trouble starts. Let's see what happened in the case of a few unhappy souls whose bookmanship left something to be desired.

• A Beaver was about to take off one day from a sod

My friend and helper!

strip with a tree barrier, a set of conditions which even your Aunt Emma would recognize required maximum performance. The flap indicator was inoperative, so the pilot guessed his flaps down to 20°, fifteen less than he needed. The Beaver ended by being snagged on a shoestring tackle by a tall pine.

Moral: Drawing things out of hats is a risky business, whether it's the name of a prospective wife or a flap setting.

• A passenger in a Choctaw was killed in a mountaintop crash because the pilot had overlooked proper weight and balance procedures for a flight which involved landing at a destination much higher than the start.

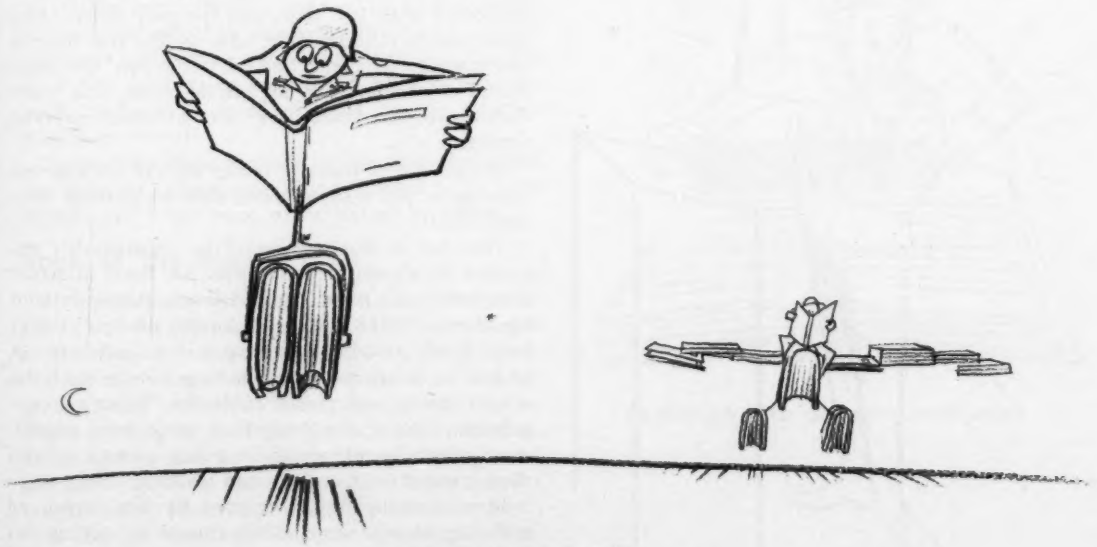
Moral: General Custer got himself and his men involved in a Last Stand because of inadequate planning.

• The pilot of a Mohawk was killed in a crash because he either did not know, or failed to use, the ejection procedures the book calls for.

Moral: Ocean liners almost never sink these days but they have boat drill just the same.

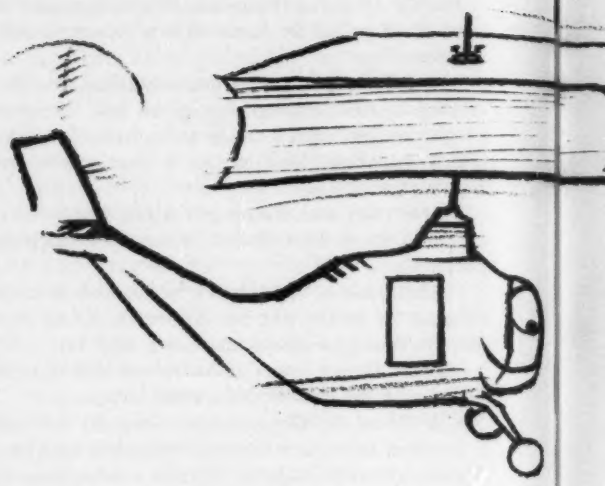
• A Sioux fanning merrily along 25 feet above a patch of trees on a mountainside was caught in a downdraft and crashed. Things would have been okay if the pilot had observed the 150-foot minimum stipulated by the local SOP.

Read these handbooks; they STOP a lot of trouble



I'm a real fly-by-night!

the Army doesn't have room for anybody who is NOT a real professional

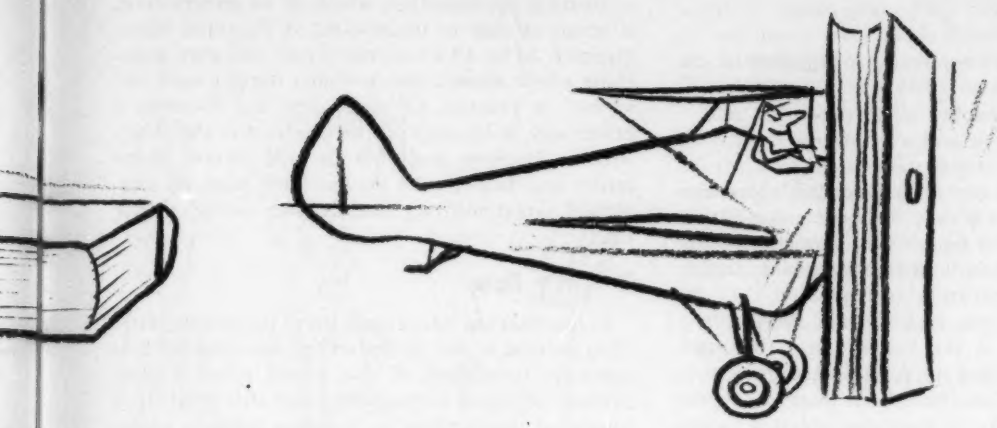


Moral: If a sign says "Beware of the Dog" you can figure it wasn't put up to draw laughs.

• A Seminole pilot attempting a landing tried a go-around with full flaps and his gear down. The book says it is impossible, that unless you have a safe margin of speed and altitude you are committed to the landing, no matter what. The pilot discovered the book was one hundred percent correct.

Moral: There must be better ways of finding out whether or not a stove is hot than by putting your finger on it.

This list of booboos could be considerably extended by almost anybody who has been in Army Aviation much more than 48 hours. Anybody who has been in for 48 months, or longer, probably won't have much trouble recalling a few incidents in which he himself played a bigger role than he would like to take public credit for. There's a consolation. Nearly everybody *does* profit from experience, otherwise we would be going around all the time covered with paint from walking under stepladders, nursing fingers burned by hot stoves, or suffering from stomach-aches caused by eating too many green apples.



More important than rotor blades or a prop!

A pilot who has luckily come through a goose-pimply episode which arose from the book's being ignored doesn't need to have the moral spelled out in simple terms. He's a convert to bookmanship. A mechanic who has seen what can happen when improper maintenance is the result of skipping the book has no trouble convincing himself that the book ranks well ahead of Fido as the aviation man's best friend.

People like these are like drunks who have seen the light and given up palling around with John Barleycorn. They want to be joined by others.

Book of the Month Club

If a good many senior citizens—COs, pilots, crew-chiefs and the like—fail to have a full appreciation of the absolute necessity of following the book to the letter, you can hardly expect the rank and file to be model bookmen. When Pop spends all day Sunday sitting on the front porch in his undershirt, drinking beer and scratching himself, his son and heir isn't likely to grow up with a taste for Ivy League suits. Somebody has to set an example.

So the old hand who has seen the light is fired with the kind of zeal which sends missionaries out

I go through mine with a fine tooth comb

to places where the boomerang is regarded as the ultimate weapon. He

knows the Book,
uses the Book, and
spreads the word.

A CO or anyone else in a responsible position makes sure there are plenty of books around, that each pilot has one for his aircraft, that changes are posted as they come in, and that everybody understands revision systems and terms.

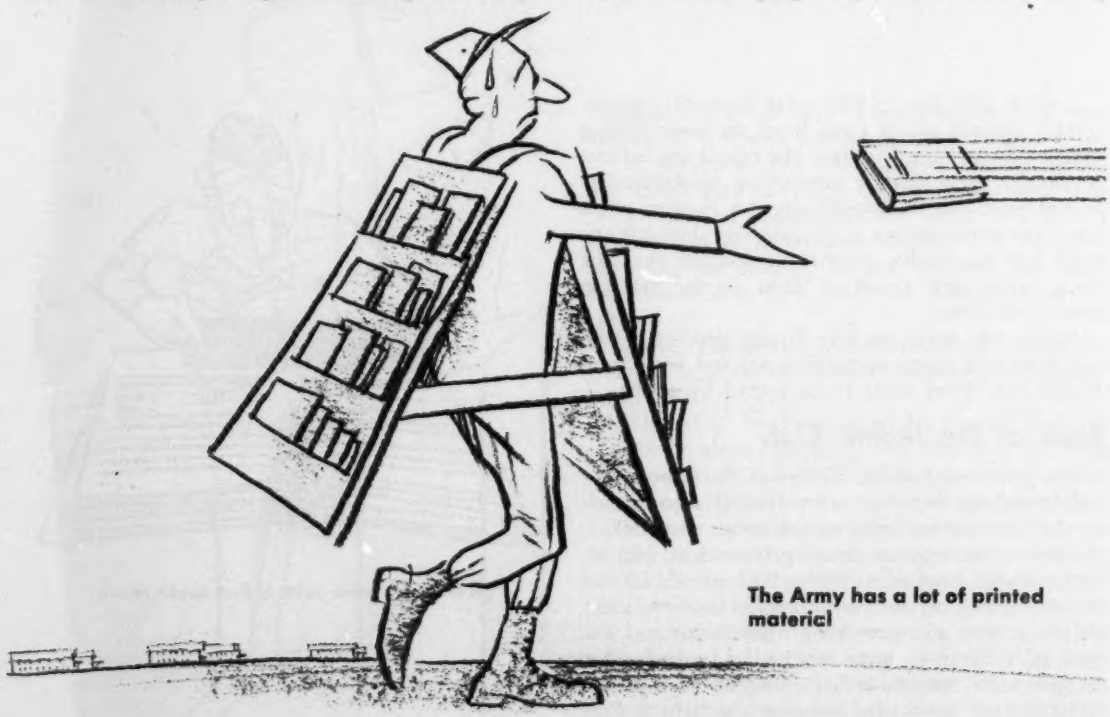
And another big item. Nobody need accept everything in the book as the Simon pure, 100-proof, Gospel truth just because it is written down in black and white. There have been instances in the past in which the book has been in error, when the procedures it calls for are dangerous, unworkable, or just plain inefficient.

When a crewchief, a pilot, or anybody else catches the book with its face hanging out he should blow the whistle. It doesn't have to be a major blunder such as giving instructions for installing the rotor blades upside down. Most of the time it is a matter of simple improvement in procedures or of clearing up something which in its present form is about as easy to understand as Egyptian hieroglyphics. As we all know, every now and then something which seemed fine in theory doesn't work out so well in practice. Or some alert lad discovers a better way. If he sings out he can be sure somebody will be listening and that he will receive warm smiles and hearty pats on the back from all concerned. Great military careers have started on far less.

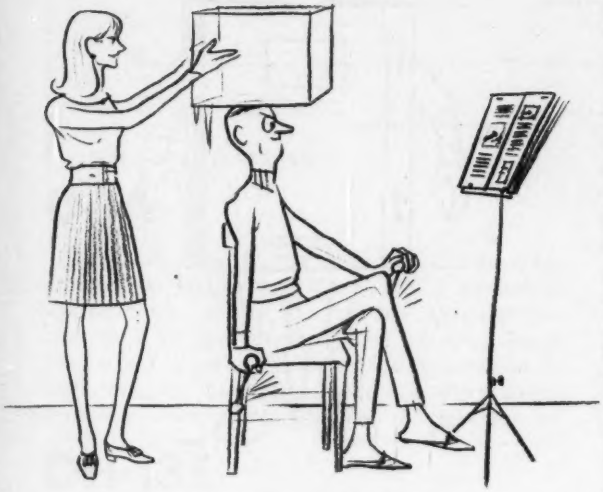
It Ain't Easy

Saying that the Army has a lot of printed material lying around is akin to remarking that coon hounds generally have fleas. A man could spend a long lifetime trying to keep abreast and still wind up a couple of thousand or so volumes behind—assuming, of course, that he didn't land in a padded cell when he was halfway through the job.

Keeping abreast, instead, is a matter of judicious selectivity and personal responsibility. Knowing a little about a lot is not much better than knowing nothing at all. In Army Aviation, a man must decide what applies to him and the task he has on hand and then plug away at it hard and steady



The Army has a lot of printed matericl



Plug away at it hard and steady

until he knows everything the book can tell him. It becomes a part of his essential equipment, like his helmet, his tools, or his ID card. It is an old friend, trusted, tried, and true.

The man who really appreciates what the book stands for knows it won't work unless it is used *all the time*. A dieter trying to reduce to the point where the girls won't fall over laughing when they see him on the beach has to stick to his program with the grim determination of a marathon runner. If he sneaks off a couple of times a week and loads up on banana splits, he might as well forget the whole thing. The girls are going to keep on laughing.

It is no laughing matter when a man in a hurry or preoccupied with something else decides to forge ahead just this once without consulting the book he thinks he knows. Just this once may be the very occasion when a memory which has worked well in the past decides to roll over and play dead. One more good aircraft—or one more good pilot—is removed from the rolls.

Like most things worth doing well, knowing the book and using it properly is tough, time-consuming, and tedious. The temptation to avoid it is as

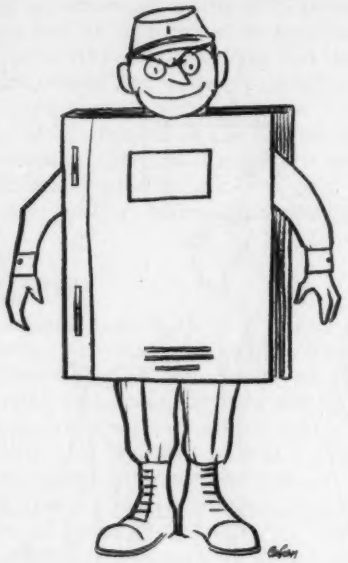
Dilbert uses his safety belt ALMOST all the time!

attractive as the slinky blonde who gives you the eye from the back booth in Paddy's Bar and Grill. When such occasions arise, the only thing to do is to grit your teeth and avoid trouble by thinking of the wife and kiddies waiting for you so trustingly at home.

It doesn't hurt to think of them also when you're tempted to ignore the book—to experiment, to skip something, or violate prescribed procedures. You owe it to them, to yourself, and to everybody in the Army to follow regulations to the letter. Otherwise one day you go to the well once too often and you or some other man the Army cannot afford to lose will become just another item in the accident statistics.

The real professional knows what rules are made for and he respects them. He follows them to the letter every time, knowing that his own safety and that of a considerable number of other people are dependent on orderly, uninterrupted, conscientious, step-by-step, standard, by-the-book procedures.

The Army doesn't have room for anybody who is *not* a real professional.



The real professional

A genuine fortress!

SHARE IT!

AN ACCOUNT OF A NEAR-ACCIDENT OR FLIGHT-HAZARD

(AR 95-29)

On _____ (date), I was _____ (flying, taxiing) on a _____ (VFR, IFR, DVFR)

clearance when I _____ (experienced, observed) a _____ (near-accident, flight-hazard)

THIS IS WHAT HAPPENED:

O-1A

"After returning from a dual night checkout, my student was taxiing into the chocks. I noticed he was off center to the left and had him stop the aircraft. If we had continued, the left wing would have struck a parked aircraft. This was caused by high intensity ramp lights reflecting from an oil slick which the student mistook for the right chocks."

OH-13E

"The pilot requested and was given a special VFR clearance out of the control area. He was told to maintain communications with the tower and acknowledged. For the next 90 minutes, the tower was unable to contact the OH-13, and IFR traffic was backed up. The pilot, who was VFR in the area, could have landed and called in if his radio was out."

O-1F

"As I approached on short final, I heard the tower clear a flight of two other O-1s to land. They were told to follow the light aircraft (me) on short final. The next thing I knew the lead O-1 slipped by me, clearing to my left by less than 25 yards, and started to round out about 50 yards in front of me. I was too far in my roundout to go around. Fortunately, he landed with little or no flaps and rolled out much faster than I did. To make this incident more serious, I was landing with minimum clearance behind a C-123. To land in front of me, the other pilot had to land dangerously close in the wake of the C-123."

OH-13H

"Three miles out, I called the tower and received clearance to enter straight in on the downwind leg of the traffic pattern. Just as the tower operator cleared me, I caught a flash of reflected sunlight about 90° to my right. I looked in that direction and saw an F-105 about 500 feet away at my altitude and headed straight for me. I went into a diving autorotation. At the same time, the pilot of the F-105 cut in his afterburner and went into a steep climb, leaving a large cloud of black smoke behind him. The jet passed directly over me at a distance of about 100 feet and droplets of unburned JP-4 splashed on the bubble of my helicopter. I also felt turbulence.

"There have been many sightings and several near misses in this area of high performance aircraft that have strayed out of their authorized low level flying areas. There are many small helicopters operating here and they don't have much chance of getting away from a jet traveling at 500 mph plus, especially at little better than treetop level and in hazy weather conditions."

U-1A

"We were on an IFR radar surveillance approach in marginal weather when approach control advised that an aircraft behind us had declared an emergency. We were vectored 90° right off the final approach leg while the emergency aircraft landed. Approach control gave us another 90° right turn to take us away from the airfield. We were directed to turn further right through 90°, putting us on base leg, and then were vectored back on final. As we were completing the turn to final, approach control advised that we had a target at 10 o'clock, 1/4 mile. At this instant, we broke momentarily into the clear, and out of a cloud to our right front came a C-97. The other aircraft had cancelled IFR prematurely and was approaching an adjacent airfield. We made a violent dive and missed the C-97 by an estimated 175 feet."

CH-34C

"We were making an approach to a helipad surrounded on three sides by powerlines and were

guided from the ground by radio. When we were approximately 10 feet from the ground and about to terminate the approach, there was an excited call over the radio, 'You're in the wire—you're in the wire, go up!' I applied power to climb, looked out the window and saw a communication wire being dragged along the ground. I made a 180° turn and landed. Before our approach, ground personnel had warned there were powerlines in the vicinity of the helipad which we had in sight. No mention was made of the communication wire and our approach was made from the one direction that would not involve flying over the powerlines."

U-6A

"I reported long left base for runway 36. Another aircraft reported 8 miles, entering right base. The tower cleared both aircraft. I reported turning 3 mile final and met the other aircraft as it turned final. I went around and the other aircraft landed."

U-8D

"My copilot and I had recently completed U-8 transition training and were on a service IFR flight. Our destination was strictly a VFR field and the usual practice was to shoot an instrument approach into the municipal airport, break it off when VFR, and proceed to the destination VFR. The weather at the municipal airport was reported as 2,000 feet overcast and 5 miles. We were turned over to approach control from the center and given clearance for an approach to runway 28R. We were advised that two jet aircraft were in the pattern, shooting practice ILS approaches on VFR clearances. The municipal airport was used by major airlines for training. We acknowledged and started our approach.

At 2,000 feet, we broke out and my copilot asked if I wanted to cancel IFR and proceed directly to our destination. I decided to continue the ILS because we both needed the practice. We had descended to 1,700 feet, procedure turn altitude, and were clear of the clouds. However, I was still on the gauges, and the copilot was busy tuning radios and making the required reports. Suddenly, a sixth sense forced me to look up. There, in a climbing right turn about 300 feet from us, was a Boeing 707. I pulled off all power and dived to the right. We passed about 500 feet from the 707. I contacted approach control and told them about the near miss. They asked if I wanted to file a violation against the 707 pilot and I replied no, knowing full well that the hazard was partly our fault for having our heads in the cockpit, even though we were on an IFR clearance."

O-1A

"As I started to pull back the stick for roundout, the nose raised one or two degrees when my elevator jammed and the stick would not go any further to the rear. Aileron control was not affected. I jerked the stick to the rear several times with no results. At about 10 feet, I added full power and shook the stick from side to side, still pulling as hard as possible. The stick came free just in time for me to get into a three-point attitude. The aircraft hit hard and bounced high. I recovered with power and went around. During the climb, my observer removed the two helmet bags which had been stored on the floor. I have stored helmet bags on the floor for years. From now on they'll go into the baggage compartment."

UH-1B

"We were cruising at 1,000 feet and 90 knots when a fixed wing aircraft passed 40-50 feet to our right at a high rate of speed going in the opposite direction. Looking closer, we saw that the fixed wing aircraft had an approximate 20 inch wingspan. It maneuvered as though radio controlled, but I was unable to determine the controller's location in the town below. Magazine specifications of a similar radio controlled model indicate they are capable of 90 mph."

CH-21C

"I was flying as backup on a rescue mission for an individual who had fallen off a seaside cliff. The rescue aircraft had landed and I was circling at 375 feet, providing radio relay to the nearby Air Force base. A small flying club aircraft flew between us and the rescue aircraft on the ground, circled once and flew off. I flew a wide pattern to attempt an approach to the shallow water at the base of the cliff. I was concentrating on the approach when my crewchief called that we had just missed an aircraft. It had come from our right rear and missed us by not more than 50 feet. After we landed, I found that the pilot (with less than 25 hours logged) had just been cleared for solo flights on a student ticket. She (woman driver!) stated that she was wondering what was going on on top of the cliff and was watching the crowd. She also stated that she had never seen my aircraft during the entire time she was circling the area."

Air Locks For Air Delivery

RECENTLY I had a bull session with a friend who is a test pilot for a commercial helicopter firm. He was telling me about the many strange situations he gets into in his line of work.

As an example he told me about the time he was delivering a Bell 407 (UH-1) helicopter to a customer when the tail rotor 42° gear box went out. He managed to autorotate into an open area just big enough for the main rotors to clear. It was virtually impossible to reach him on foot.

He radioed his field office and told them his troubles. He figured they could drop a replacement and he'd be on his way again.

Perhaps it was two hours later that he heard an airplane approaching. He got out in the open and was immediately spotted. The company pilot indicated that he would make a drop. On the first pass he let go with a package of food, a few tools, and drinking water.

On the next pass he came in very low and dropped a flat-looking object about 2 feet square. It hit the ground and bounced drunkenly like a football. On the radio the company pilot said that this was the tail rotor gear box. It was in a new kind of package and he felt sure it was OK in spite of the drop.

Well, to make a long story short, the 42° tail rotor gear box was in perfect condition. In about 20 minutes my friend had it installed and was on his way. He didn't even take time to eat the food.

Later I made it a point to learn about this new packaging that makes it possible to air-drop extremely delicate equipment from substantial heights without damage. Called an "air lock," the airtight plastic case is designed to protect pieces of equipment during shipment and storage and in emergency airdrops.

The package consists of a divided plastic casing. The airtight section is backed by a foam plastic cushion. After a part is inserted and zippered in, air is pumped in to seal it against the plastic wall. The air and plastic cushioning absorb and dissipate shock and vibration. The part is also safeguarded against moisture and atmospheric contamination. In the long trip from factory to the user, the part may be inspected through the clear plastic top. Once the part is removed, the package can be reused.

Containers to be used in high altitudes are made of a semiflexible plastic material which permits expansion of the bag without danger of bursting and subsequent loss of air. Air locks containing raw eggs and sensitive electronic items have flown to 50,000-foot altitudes in unpressurized cabins without any damage from expansion, the manufacturer claims.

To demonstrate the dropping capabilities of air locks, fresh eggs survived a drop from a four-story building. The eggs landed uncracked on a hard concrete surface.

Besides just the ability to protect equipment from damage, air locks have other characteristics that may be of interest to the Army. For one thing they float. Drops may be made on lakes and other bodies of water for easy retrieving. Secondly, they don't take up much room when empty and therefore may be of interest to Special Forces who are in need of an easily disposable package.

Most interesting possible use is in the delivery of whole blood. Whole blood is still most important in the care of wounded personnel. But quick delivery of fresh blood to troops in heavily wooded areas can be a problem. Parachutes have not proved entirely satisfactory. An air lock may be the answer. In any case, the U. S. Army Aeromedical Research Unit at Fort Rucker, Ala., is to test them for this purpose.

New Instrument Trainers

THE ARMY HAS received the first of its new T-42A fixed wing instrument trainers and has ordered an additional 26 of its new TH-13T rotary wing instrument trainers.

Army acceptance of the four-place T-42A (B-55 Baron) marked initial delivery of the new trainer under a $20 million contract awarded Beech Aircraft Corporation.

The B-55 Baron was selected by the Army earlier this year, following a competitive evaluation and test program involving four manufacturers. The contract calls for 55 T-42As to be delivered at the rate of five per month. In addition to instrument training, the Army plans to use the T-42A for twin engine transition training.

The two-seat TH-13T (Model 47G-3B-1) order is part of a $5.7 million contract awarded Textron's Bell Helicopter Company.

Model 47G-3B-1 was the winner last year of a commercial "off-the-shelf" competition among five aircraft from three companies. The contract calls for delivery of 103 TH-13Ts.

	T-42A	*TH-13T*
Engines	Continental, 260 hp each at 2625 rpm	Lycoming, 270 hp turbosupercharged
Maximum Cruise Speed	195 kt	78 kt
Service Ceiling	19,700 ft	Over 20,000 ft
Maximum Range	1,460 miles	260 miles
Maximum Flight Duration	7½ hours	3 hours